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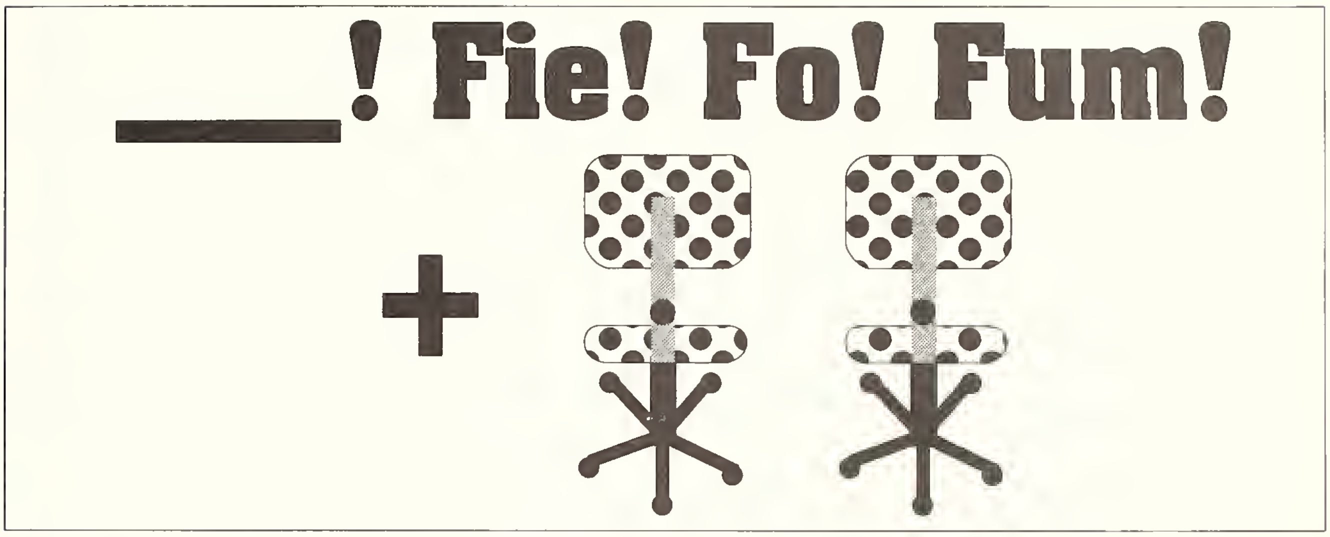
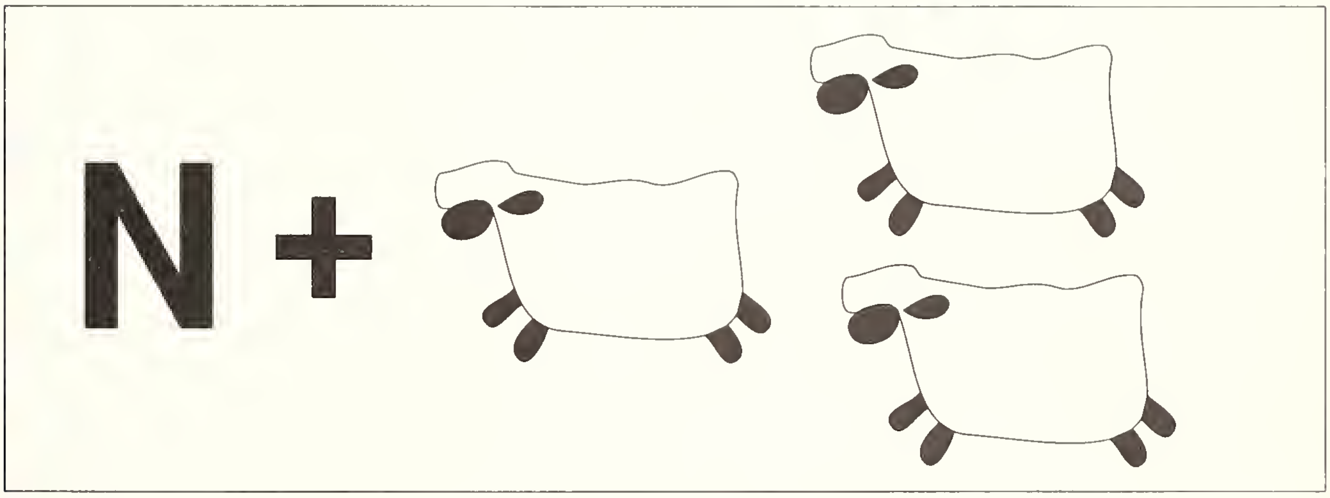
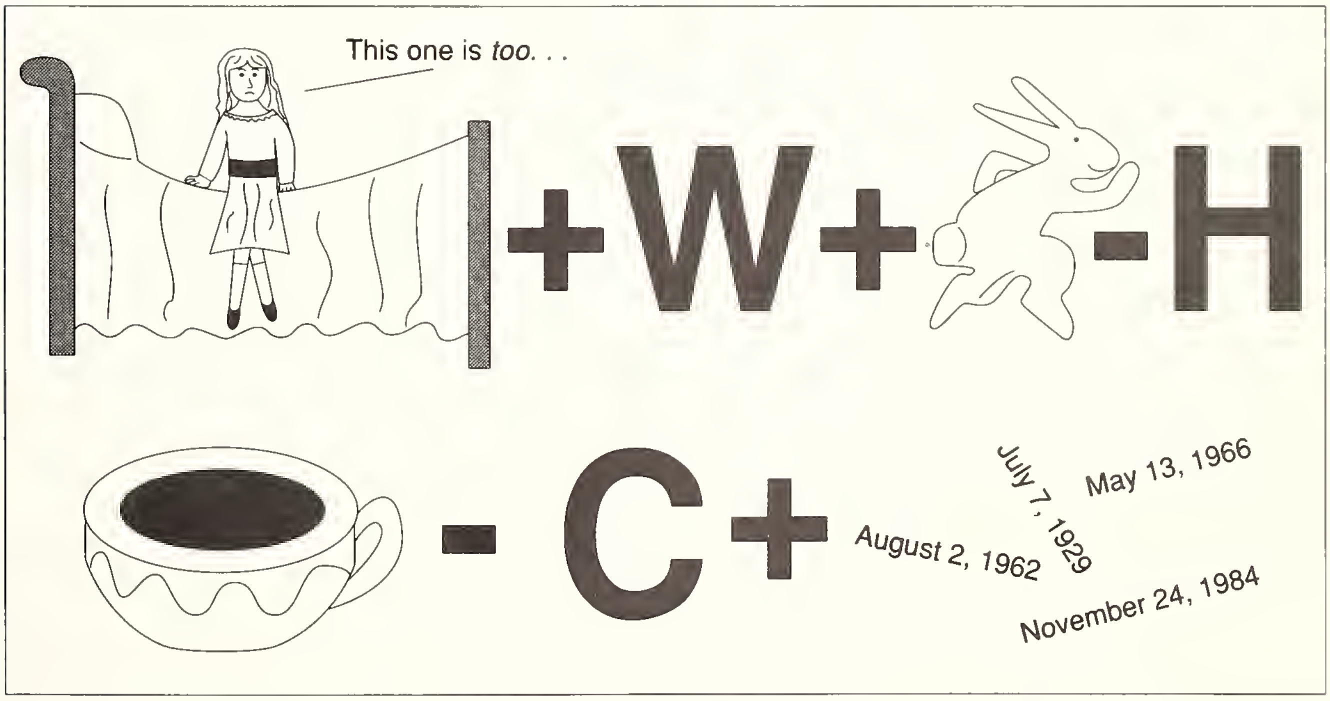
ComputerNews

Inside this Issue







Answers: Features, News, Software Updates

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Contents

Features

Macworld Toronto: The Seminars 1
How to Obtain the INTERNET Resource Guide 4
Archie 6
All About Passwords 8
1991 *ComputerNews* Index 23

News

Site Licence Purchase Procedures 10
Novell Site Licence Update 12
New Configuration in UTCS PC Education Facility 12

Numerical and Scientific Software

SPSS V4.1 under CMS Now Available 13
Maple Corner: News for Maple Users at U of T 15
Numerical & Scientific Software Updates 18
Microcomputer Short Courses 22

Departments

UTCS Services 26
Consulting & Enquiries 27
UTCS Directory 28
Terminal and Advising Sites 28
UTCS Site Licences 29
PC Maintenance 34
UTCS Software List 35

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This newsletter was entirely produced on a Macintosh using PageMaker and other related Macintosh software.

Macworld Toronto: The Seminars

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I love going to computer shows. An inveterate accumulator, I derive great satisfaction from wandering up and down the aisles, filling souvenir bags with glossy advertisements for the latest assortment of state-of-the-art products I can't live without. I gladly endure high-pressure pitches from eager salespersons bent on getting one more commission if I can enter a contest and possibly become the excited winner of a few extra megabytes of RAM, a designer mouse pad, or dinner for two at a restaurant where I don't have to use a drive through and shout my order into a clown's mouth.

Hence my pleasure in attending the Toronto Macworld conference in October, 1991. True to form I stumbled home, bent under the weight of the usual assortment of printed paraphernalia. However, it was the seminars I attended that really made the show worthwhile for me. I like to reap the rewards of others' experience, and the seminars provided me with the opportunity to glean pearls of wisdom from a body of experts and Macintosh veterans. Please be advised that my personal interest is limited to subjects relevant to desktop publishing and presentations. If you want to know about the seminars on databases or electronic mail, you will have to ask somebody else.

Overcoming Font Phobia

Led by David C. Jenkins, National Sales Director, MacAcademy

This seminar was elementary in nature, geared toward those who had little or no understanding of how Macintosh fonts work. Topics such as the difference between screen and printer fonts, and bitmapped and PostScript fonts made up the bulk of the talk. TrueType and System 7 were also explained. Save for the overview of TrueType, which was new to me, and an incident explained below, I found this one to be a bit of a yawn since I am already conversant with many of the technicalities of typefaces.

When David Jenkins was discussing bitmapped typefaces I was on the edge of my seat. He mentioned that in the past the tradition has been to give them names of cities–New York, Chicago, Geneva, and the like. He then went on to say that soon we should expect to encounter PostScript typefaces that have been given city names (fair enough), and that Zapf Dingbats is a bitmapped typeface that does not possess a city name (wrong! Wrong! WRONG!) The last time I checked, Zapf Dingbats printed out with clean, PostScript-generated lines. Fear not, Hermann Zapf; I've set the record straight.

Rating: B-

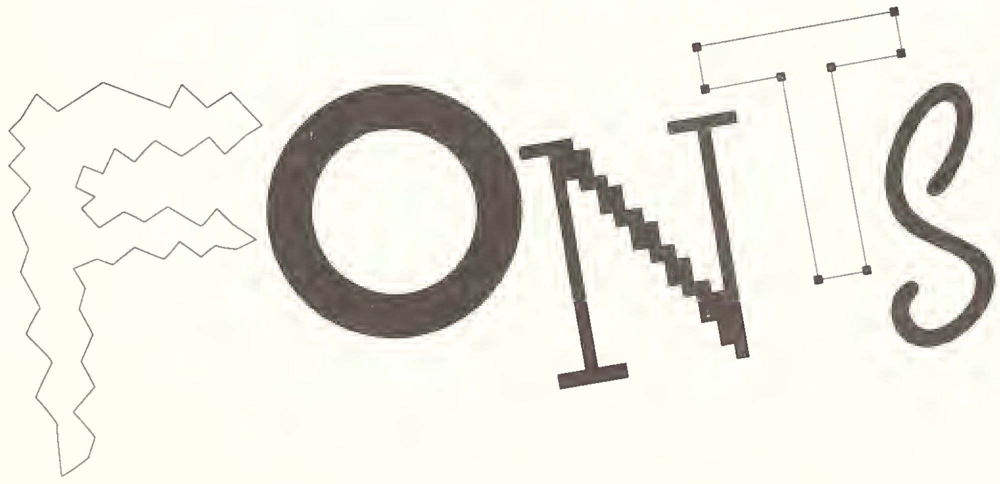
—MM

Inroads in Publication Design

Panel included Jonathan Rogers and Courtland Shakespeare, WYSIWYG Studios; Ed Cleary, The Font Shop; Louis Fishauf, Reactor Art & Design; Georges Haroutiun, Applied Arts Quarterly

In this seminar, the panel of experts shared with the audience their experiences and opinions about designing and publishing with Macintosh systems. Their perspective was somewhat historical in nature (history encompassing approximately five years), so we heard the customary tales of files that became corrupted and pages that refused to print.

We were also treated to personal anecdotes and insights. Georges Haroutiun, for instance, trained in Denmark in the Bauhaus tradition (clean lines, no rulers allowed, much emphasis on hand lettering), enlarged his collection of graphics



tools to include the Macintosh. Initially, he questioned his potential as a Macintosh user given his inability to grasp seemingly simple technology, like programming his VCR to record television shows. He has since mastered Quark XPress, and seems to get along just fine with his Mac.

Ed Cleary of the Font Shop shared the ups and downs of his experience in trying to publish a catalogue of approximately 5,000 typefaces. Parts of this monstrous project, that used both a database and a page layout program, were being assembled in at least three different countries. The catalogue, which was not complete at the time of the show, will be available by the time you read this article.

For a little contrast in the program, the audience was presented with a series of colourful slides to illustrate just how far design on the Macintosh has advanced over the past few years.

Further review of this seminar would occupy too much space. Suffice it to say that I really enjoyed this one, and was truly impressed by the wondrous things some Macintosh users are doing.

Rating: B+ (I would have given it an A, but one panelist, who shall remain nameless, was supercilious and insulting, thereby tarnishing an otherwise superb seminar.)
—MM

Slide Tip #1

Use the "KISS" method.

Keep It Short and Simple

How to Get Started with Desktop Presentations

Led by Robert Fadden, Computer Training and Support Corporation; Jeff Loechner, Mac in Design

Since I know very little about Desktop Presentations—on the Macintosh or otherwise—I took immediate interest in this introductory seminar, which claimed to cover the basics of creating effective presentations on the Macintosh. My interest was further piqued by the presentation style of the two leaders. Both were talkative and enthusiastic, and very skilled at keeping the audience's attention. Presumably because of the time of the seminar (which was mid-afternoon, when most of us get a post-lunch desire to snooze), they seemed convinced that the audience needed to be kept awake. (They may also have thought that their audience of serious Torontonians needed to be livened up a bit!) Lively banter between themselves and with the audience was their method of doing this. Though their style often seemed more appropriate to a game show than to a computer exposition, they did succeed in keeping my attention long enough to derive some useful information from this introductory talk.

Most of the hour was spent viewing slides illustrating the various points Fadden and Loechner wanted to make. Hints like "don't put too many points on one slide or you may overwhelm your audience" were accompanied by slides illustrating the error, then followed by revised slides that were well-organized and easy to read. They also provided a "checklist" to help presenters avoid common pitfalls in making presentations. For example, they suggest that you make sure the equipment necessary for your presentation is in the room in which you are presenting and that you test it for possible problems before the presentation date. In addition, the experts showed how to use colour to enhance readability and improve the visual impact of a presentation.

In addition to providing hints and tips like the ones above, Fadden and Loechner also emphasized the importance of grasping and holding the attention of an audience, and suggested techniques such as humour and audience participation as good ways of doing this. I didn't have to look far to see a demonstration of these techniques. Indeed, Fadden and Loechner were perhaps too effective, since what stands out most in my mind about the seminar is their buoyant style, rather than its actual content. Overall, however, the seminar provided a thorough, if basic, introduction to making desktop presentations on the Macintosh.

Rating: B
—ER

Efficient, Effective Pre-Press

Panel included Tom Beakbane, Beakbane Marketing; Michael Kieran, Desktop Publishing Associates; Shane Steinman, ColoRip Pre-Press Inc.; Simon Tuckett, RoboShop Design

If you plan to create artwork that is going to be printed in colour and want to produce the separations yourself, it is vital that you prepare your camera-ready art properly so that the image you want is the image you'll get. In this seminar, the panelists stressed the importance of thinking about your separations: if you make a mistake with your chokes, traps, and spreads, you'll have a real mess on your hands when your publication comes back from the printer. They also pointed out the limitations of blends, how images that look great on your screen can look awful when printed, and how imaging time can slow to a crawl if you are trying to do too many "clever" things.

Their talk was supplemented by a slide show featuring colour images some of them had created. Again, the perspective was historical; we saw colour newsletter covers created by Simon Tuckett at a time when he had to write his own PostScript code to get what he wanted. All in all, a good seminar.

Rating: A
—MM

Colour Output and How to Get It

Led by Jonathan Rogers and Courtland Shakespeare, WYSIWYG Studios

Another seminar for those interested in colour work. The audience listened to what I found to be a lot of high-tech talk; I imagine that those who were more familiar with preparing colour artwork understood much more than I did. I came away from this one with three basic impressions about what you need to be successful in creating colour output: 1) a good, fast computer; 2) a good, fast imagesetter; and 3) a good, solid background in the graphic arts.

A slide presentation illustrated works that had been created by Rogers and Shakespeare. A few slides demonstrated the principle of colour separation and trapping.

Rating: B
—MM

Desktop Publishing Daredeviltry

Panel included Michael Kieran, Desktop Publishing Associates; Simon Tuckett, RoboShop Design; David Vereschagin, Quadrat Communications

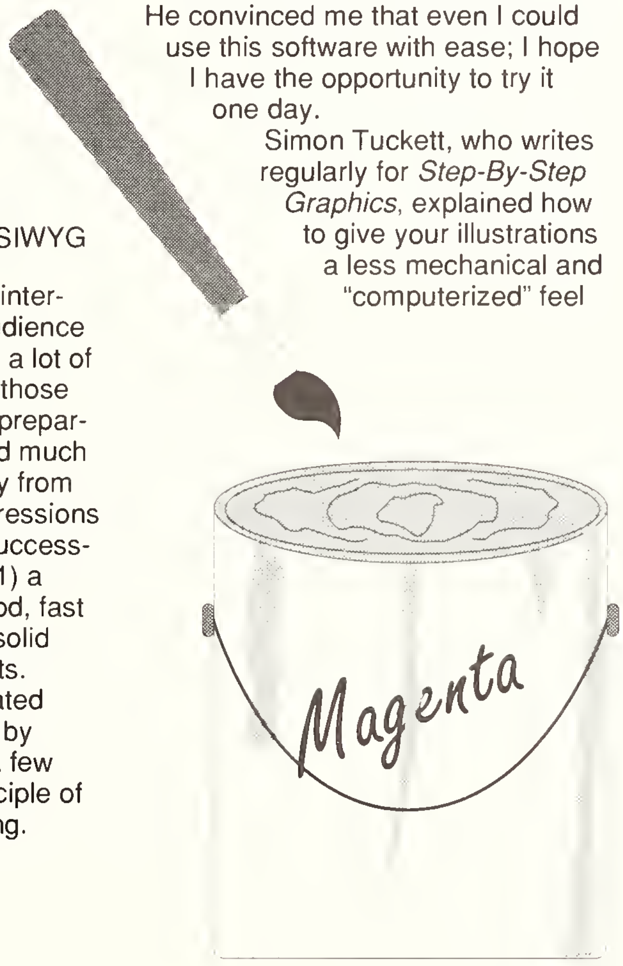
I looked forward to this seminar with breathless anticipation, hoping that I would learn something that would revolutionize the way I work (or at least allow me to show off a bit). That wasn't quite what I got, but I enjoyed myself nonetheless.

Michael Kieran started off by demonstrating a pre-release version of a new photo imaging program called Cachet. It appeared to be fantastically simple to use: after you scan a colour photograph, you open the scanned image in Cachet, press a few buttons and make a couple of adjustments, and Voilà! You will have a more visually pleasing balance of colour, and you don't have to be a colour wizard to get it. He convinced me that even I could use this software with ease; I hope I have the opportunity to try it one day.

Simon Tuckett, who writes regularly for *Step-By-Step Graphics*, explained how to give your illustrations a less mechanical and "computerized" feel by scanning a hand-drawn image and then tracing it in a program like FreeHand or Illustrator. I have read articles he has written about this subject and seen examples of the technique. His methods are quite effective.

David Vereschagin shared with the audience his experience producing a cookbook using Quark XPress. For quite a long time he talked about using special short cuts when working with text. It finally dawned on me that he was talking about style sheets, collections of formatting information that make formatting easy and the look of your document consistent. I've been working with styles for years, so I didn't find the subject to be even marginally daredevilish. For me, and for many others, styles are a fact of life in electronic publishing. Given that this particular seminar was advertised as being of interest to advanced users, I thought that discussing styles was off the mark. Vereschagin redeemed himself, however, when he showed the audience how to do neat tricks with paragraph rules, and demonstrated to XPress users how to apply two different styles to one paragraph of text. That was a revelation, and I wish I could do it with PageMaker.

Rating: B+
—MM



In Conclusion

I came away from Macworld with the satisfied feeling of one who has supped at a fine buffet; I had a little of this and a little of that, enough to please but not enough to cause heartburn. I hope I'll be there the next time Macworld comes back to Toronto. I should be easy to recognize; I'll be the one going back for seconds on the brochure circuit.

How to Obtain the INTERNET Resource Guide

Herb Kugel
herb@gpu.utcs.utoronto.ca

In a recent issue of *ComputerNews* we introduced the INTERNET. The INTERNET, which is a network of networks, contains a vast array of information that the interested user can access. The INTERNET Resource Guide (hereinafter called the Resource Guide) is a large document that provides information about a very large series of networks. It provides information about resources available on the INTERNET. As its publishers are constantly updating it, interested users are urged to subscribe to these updates. If you would like information about how to subscribe, please contact me at the electronic mail address given at the end of this article.

You can obtain the guide itself through the File Transfer Protocol (FTP) which allows you to access a remote machine and transfer files from it to your machine. You can obtain the Resource Guide as a single file, but this file is so large that this is impractical. However, you can use special UNIX commands that allow you to process a specific type of file and, in the case of the Resource Guide, create a series of directories. Each new directory would contain a chapter of the Resource Guide.

The following text shows how the Resource Guide is obtained through the FTP and how the manual is built on your machine. The process, which is quite straightforward, uses the "uncompress," and "tar" commands. You can read about them by using the UNIX "man uncompress" and "man tar" help commands, though generally this is not necessary if you follow the outline shown below.

The INTERNET Resource Guide outline is available in both text (txt) and PostScript (PS) formats. You may obtain either format or both formats at the same time, but if you are not familiar with the document, it might be wise to begin with the text version and browse through it. Then, if you have access to a PostScript printer, obtain the PS format files and print them if you wish.

You must begin by accessing the National Science Foundation machine through the FTP and continue as shown below. The commands you type are preceded by a pointing hand (☛). The system responses are from an actual FTP session, and are not preceded by an icon.

```
gpu.utcs%                         ☛ ftp nnsc.nsf.net
Connected to nnsc.nsf.net.
220 nnsc.nsf.net FTP server (Version 5.59 Mon May 14 13:48:21 EDT 1990) ready.
Name (nnsc.nsf.net:herb):         ☛ anonymous
331 Guest login ok, send ident as password.
Password:                         ☛ herb                    (Type your account
                                                             name, or logon id)
230 Guest login ok, access restrictions apply.
Remote system type is UNIX.
Using binary mode to transfer files.
ftp>                              ☛ cd resource-guide
250 CWD command successful.
ftp>                              ☛ get resource-guide.txt.tar.Z
200 PORT command successful.
150 Opening BINARY mode data connection for resource-guide.txt.tar.Z (171240 bytes).
226 Transfer complete.
171240 bytes received in 55 seconds (3 Kbytes/s)
ftp>                              ☛ bye
```

```
221 Goodbye.
gpu.utcs%                    ☛ uncompress -v resource-guide.txt.tar.Z
resource-guide.txt.tar already exists; do you wish to overwrite
resource-guide.txt.tar (y or n)?  ☛yes
resource-guide.txt.tar.Z:  — replaced with resource-guide.txt.tar
gpu.utcs%                    ☛ tar -xvf resource-guide.txt.tar

x chapter.1/copyright.txt, 945 bytes, 2 tape blocks                 (Console
x chapter.1/intro.txt, 1972 bytes, 4 tape blocks                  output from
x chapter.1/section1-1.txt, 3941 bytes, 8 tape blocks                   'tar'
                                                                    command)
     .

     .

     .

     .

     .

     .

x chapter.M/sectionM-7.txt, 2652 bytes, 6 tape blocks
x chapter.M/sectionM-8.txt, 3191 bytes, 7 tape blocks

gpu.utcs%                    ☛ ls -F              (Enter this command to obtain
chapter.1/                                          listing of Resource Guide
chapter.2/                                        directories on your machine)
chapter.3/
chapter.4/
chapter.5/
chapter.6/
chapter.M/
```

If you have any questions about the Resource Guide, please contact *herb@gpu.utcs.utoronto.ca*.

Free Electronic Mail Demonstration
Thursday February 13, 3:00 - 5:00 p.m.

Anyone interested in sending documents to colleagues or friends reliably, quickly, and inexpensively will not want to miss this demonstration. We will introduce you to the NetNorth/BITNET/EARN communications network, which is accessible from the CMS system. This network connects more than a thousand universities and research institutes in Europe, Asia, and North America. Sending documents or files over the network is very easy to learn.

We will show you how to send mail and files to another institution, and how to talk directly to someone on the network. ***Please note this is a demonstration only.***

Space is limited. If you would like to attend this demonstration, please contact Irene Rosiecki at 978-4565 to reserve a place.

Archie

Herb Kugel
herb@gpu.utcs.utoronto.ca

Over the last few months, we have been discussing the INTERNET, the network of networks, and the vast amount of information that is available to users. In the previous article we discussed the INTERNET Resource Guide, a large volume containing a considerable amount of data about INTERNET hosts. While the Resource Guide is beneficial, it does not yield specific information about what might be available for the interested user on each host. Archie takes a giant step forward in dealing with this problem.

What is Archie? Archie is a server, designed and maintained at McGill University, that allows an interested user to do a keyword search through a large number of File Transfer Protocol (FTP) directories to obtain specific information. It is a powerful yet easy to use processor—an invaluable tool if you are planning to use the INTERNET to full advantage.

Suppose, for example, you were looking for the keyword "babylon". The dialogue between you and Archie during this search is shown below and we will assume you are a first time user. The text you are to type is preceded by a pointing hand (☛).

```
gpu.utcs%                          ☛ telnet archie.mcgill.ca
Trying...
Connected to quiche.cs.McGill.CA.
Escape character is '^]'.
SunOS UNIX (quiche.CS.McGill.CC)
login:                             ☛ archie                  (You log in as 'archie'.)
  ARCHIE: The McGill School of Computer Science Archive Server [31 Oct 1991]
 .
```

(Archie generates much useful information in the form of startup messages. You should SCRIPT your console.)

```
 .
 .
 .
archie>                            ☛ help               (Enter 'help' to get started.)
```

This will put you into the help processor. Help gives you information about various topics, including all the commands that are available and how to use them. (Please note that in this text we have shortened the dialogue to save space. When you actually have the dialogue on your screen, you will see that it is self explanatory.)

```
 .
 .
 .
Help topic?                        ☛ prog                    (Enter this to learn how
                                                          to search the databases.)
  .
```

The 'prog' command allows you to search the database for a specified pattern.

```
 The usage is:
    prog <expression>
 .
```

You should exit help before continuing, or you will find it difficult to conduct a search. To do this, press your return key until you see the "archie>" prompt

```
archie>                        ☛ prog babylon          (You are looking for the
                                                          expression 'babylon'.
                                                    This is NOT the same as 'Babylon'.)
```

Archie generates statistics as it searches, but the following output is what you really want:

```
Host wuarchive.wustl.edu   (128.252.135.4)
Last updated 17:36 29 Nov 1991

    Location: /mirrors/msdos/music
      FILE      rw-r—r—     16140  Nov  1  1986   babylon.arc

Host alex.stacken.kth.se   (130.237.237.3)
Last updated 02:32 24 Nov 1991

    Location: /disk1/pc/music
      FILE      r—r—r—     16256  Dec 10  1990   babylon.arc

Host uunet.uu.net   (137.39.1.2)
Last updated 02:49 21 Nov 1991

    Location: /systems/msdos/simtel20/music
      FILE      rw-r—r—     16140  Oct 31  1986   babylon.arc

Host rigel.acs.oakland.edu   (141.210.10.117)
Last updated 02:02 15 Nov 1991

    Location: /pub/msdos/music
      FILE      rw-r—r—     16140  Nov  1  1986   babylon.arc

Host relay.cs.toronto.edu   (128.100.3.6)
Last updated 21:06 25 Oct 1991

    Location: /pub/pc/wuarchive.wustl.edu/mirrors/msdos/music
      FILE      rw-r—r—     16140  Apr 27  1991   babylon.arc

Host rana.cc.deakin.oz.au   (128.184.1.4)
Last updated 18:25 25 Oct 1991

    Location: /pub/PC/simtel-20/music
      FILE      rw-r—r—     16140  Jul 21  1990   babylon.arc
```

You thus have the host name(s) as well as the TCP/IP addresses of hosts that contain a file with the pattern 'babylon' as part of the file name. After leaving Archie (see below), you can FTP to the nearest host and obtain 'babylon.arc,' if so desired.

```
archie>                        ☛ quit                (You type 'quit' to exit Archie.)
```

Although Archie is simple to use, it is recommended that you at least read the 'prog' help carefully before starting your searches. There are many aids for searching the databases and the searches are not case insensitive. For example, "TL" will not yield the same results as "Tl".

If you have any trouble contacting or using Archie, please send electronic mail to *herb@gpu.utcs.utoronto.ca.*

All About Passwords

Wilfred L. Camilleri

Password protection has been used for several years to control access to mainframe computer systems. More recently, passwords have also been implemented in the personal computer and local area network (LAN) environments.

What is a password? Your computer password is your personal key to a computer system. Passwords help to ensure that only authorized individuals have access to computer systems. Passwords also help to determine accountability for all transactions and other changes made to system resources, including data. If you share your password with a colleague or friend, you may be giving an unauthorized individual access to the system. What if the individual gives your password to someone else? What if some of your files are deleted or otherwise rendered unusable? Are you willing to take the blame if an unauthorized individual uses your access privileges to damage information on the system or to make unauthorized changes to data?

Open soda pop? Open saddle soap?
Open Scarborough?

Since you are responsible for picking your own password, it is important to be able to tell the difference between a good password and a bad one. Bad passwords jeopardize the information they are supposed to protect. Good ones do not.

Following are some simple guidelines you should keep in mind about passwords.

- Passwords should be kept confidential and should never be shared.
- Passwords should not be written down.
- Never use the same password twice. When you are selecting a new password, choose one that is quite different from your expired password. In fact, some systems prevent you from choosing a new password that is similar to your old one.
- Passwords should be changed frequently. The shorter the life of a password, the better. Some systems force users to change their password at predetermined intervals.
- Passwords should be at least four characters in length. Longer passwords are harder for others to guess.
- Passwords should contain a combination of alphabetic and numeric characters.
- Passwords should not be trivial, predictable, or obvious. Following are some examples of bad passwords:
  - *Obvious* passwords, such as the names of persons, pets, relatives, cities, streets, and so on.
  - *Predictable* passwords, like days of the week, months, your User ID, your birth date, or a new password that has only one or two characters different from the previous one.
  - *Trivial* passwords, as in common words like “secret”, “password”, “sex”, “computer”, and so on.

One other thing to keep in mind is whether or not it is safe to use one password for a number of different systems. If you have access to a mainframe computer as well as a LAN, *do not* use the same password for both systems. Your LAN password may not be encrypted, so the LAN administrator or other individuals with access to the system might be able to see it. Mainframe computer passwords, on the other hand, are encrypted and cannot be deciphered.

A good password is relatively easy for you to remember but hard for somebody else to guess. People use a variety of techniques to choose secure passwords. Following are some examples.

1

Use a word with one or two digits embedded in it.

Examples: hou32se, mon42day, tab81le

2

Make up an acronym based on a nursery rhyme, a favourite song or movie, or a sentence.

Examples:		
	MHALL	- Mary Had A Little Lamb
	MDHF!	- My Dog Has Fleas!
	LRRH	- Little Red Riding Hood
	OTGDY	- Only The Good Die Young
	TERM2	- Terminator 2

3

Use a three-character pronounceable word with a one- or two-digit suffix or prefix.

Examples: dam56, war34, 56dig

4

Another technique that is employed by some users requires that you choose random letters and digits from a matrix made up of random letters and digits. (The matrix can be as big as you want it to be. You may want to change your matrix from time to time.)

Example:

		Column							
		1	2	3	4	5	6	7	8
Row	1	2	f	9	2	k	d	3	g
	2	j	2	8	**d**	**5**	**3**	**6**	**c**
	3	**k**	4	k	c	9	f	3	d
	4	2	6	d	9	3	m	d	3
	5	1	9	3	4	k	l	5	9
	6	k	m	d	3	2	m	f	9
	7	9	j	d	0	l	t	x	2
	8	2	9	d	m	w	2	0	2

Pick a two-digit number at random, for example 42. Find the fourth column and go to the second row. Now pick the six characters starting at that point (i.e., d536ck). Variations of the above technique include using the random number as a prefix to your password (i.e., 42d536) or picking the characters backwards (i.e., d82jg3).

Remember the random two-digit number you chose so that if you forget your password, you can just look it up on the matrix. You can set up a matrix like the one illustrated above and keep it in a safe place. Whenever you want a new password, just pick a new number.

Finally, please remember that there really is no need to share IDs and passwords. Anyone who needs and qualifies for access to a computer system should submit a request for his or her own User ID and password.

(Wilfred Camilleri is Security Administration Manager for the U of T Systems Development department, one of the four areas in the division of Computing & Communications.)

Site Licence Purchase Procedures

Evelyn Ward
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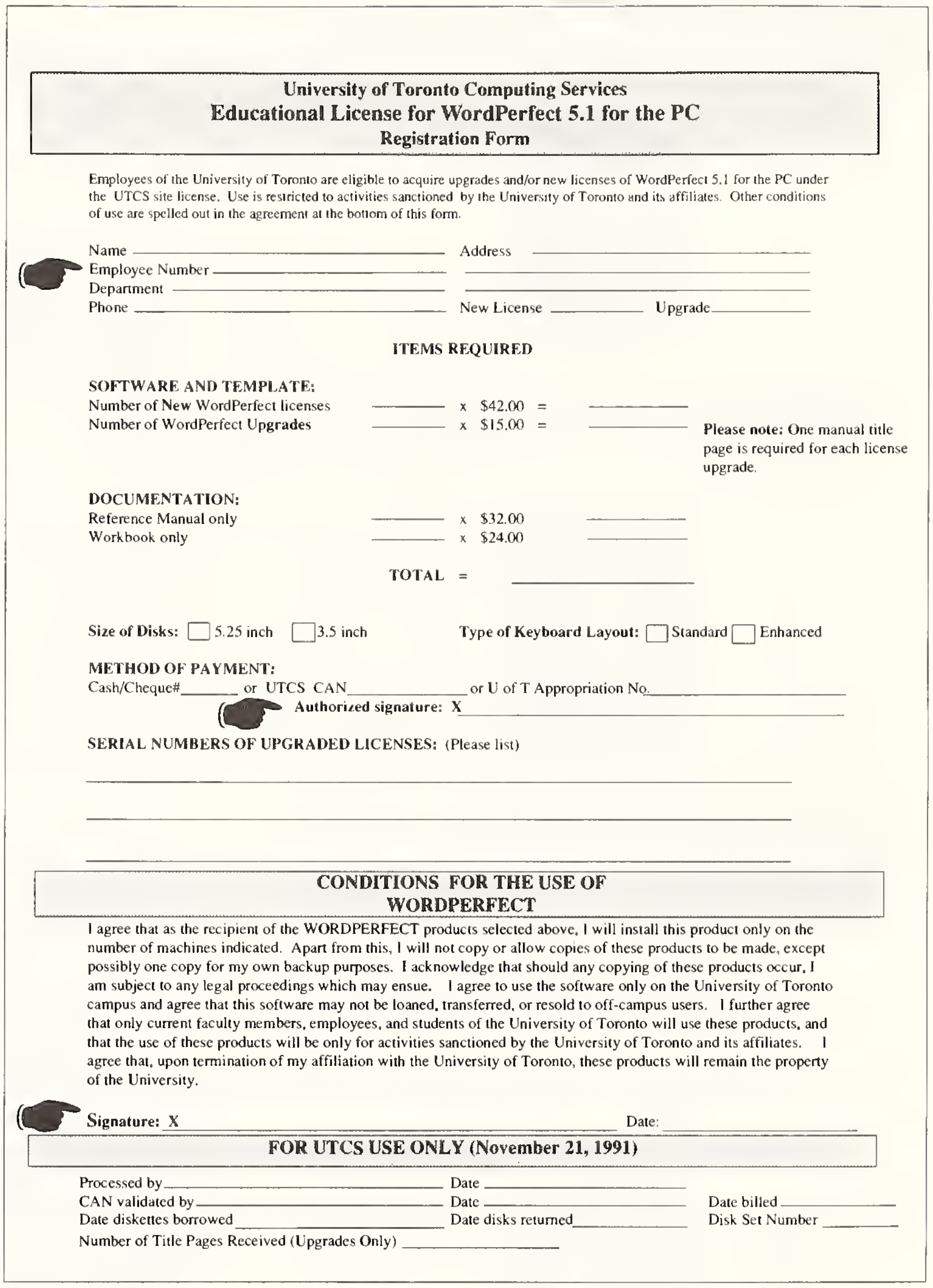
There is a range of site licence software available for purchase from UTCS for minicomputers, microcomputers and UNIX workstations. (For a comprehensive listing, see the section marked UTCS Site Licences starting on page 29 of this issue of *ComputerNews*.) Approximately one half of the software available is paid for on a yearly basis (i.e., the site licence must be renewed each year). This includes SAS, SPSS, SYSTAT, and WATFOR-77. If you hold a SAS, SYSTAT, or WATFOR-77 licence, you will receive a reminder notice along with a renewal form on July 1; if you have an SPSS licence the renewal date is November 1. The remainder of the available software – which includes Chaos, CSLG, IMSL, Maple, Novell, ProComm, QuickMail, and WordPerfect – is bought outright.



University of Toronto Computing Services
Educational License for WordPerfect 5.1 for the PC
Registration Form

Employees of the University of Toronto are eligible to acquire upgrades and/or new licenses of WordPerfect 5.1 for the PC under the UTCS site license. Use is restricted to activities sanctioned by the University of Toronto and its affiliates. Other conditions of use are spelled out in the agreement at the bottom of this form.

Name ______________________ Address ______________________
Employee Number ______________________
Department ______________________
Phone ______________________ New License ________ Upgrade________

ITEMS REQUIRED

SOFTWARE AND TEMPLATE:

Number of New WordPerfect licenses	________	x $42.00	=	________
Number of WordPerfect Upgrades	________	x $15.00	=	________

Please note: One manual title page is required for each license upgrade.

DOCUMENTATION:

Reference Manual only	________	x $32.00	________
Workbook only	________	x $24.00	________

TOTAL = ____________

Size of Disks: ☐ 5.25 inch ☐ 3.5 inch **Type of Keyboard Layout:** ☐ Standard ☐ Enhanced

METHOD OF PAYMENT:
Cash/Cheque#______ or UTCS CAN____________ or U of T Appropriation No.____________
Authorized signature: X ______________________

SERIAL NUMBERS OF UPGRADED LICENSES: (Please list)

____

____

____

CONDITIONS FOR THE USE OF WORDPERFECT

I agree that as the recipient of the WORDPERFECT products selected above, I will install this product only on the number of machines indicated. Apart from this, I will not copy or allow copies of these products to be made, except possibly one copy for my own backup purposes. I acknowledge that should any copying of these products occur, I am subject to any legal proceedings which may ensue. I agree to use the software only on the University of Toronto campus and agree that this software may not be loaned, transferred, or resold to off-campus users. I further agree that only current faculty members, employees, and students of the University of Toronto will use these products, and that the use of these products will be only for activities sanctioned by the University of Toronto and its affiliates. I agree that, upon termination of my affiliation with the University of Toronto, these products will remain the property of the University.

Signature: X ______________________ Date: ____________

FOR UTCS USE ONLY (November 21, 1991)

Processed by ______________________ Date ____________
CAN validated by ______________________ Date ____________ Date billed ________
Date diskettes borrowed ______________________ Date disks returned____________ Disk Set Number ________
Number of Title Pages Received (Upgrades Only) ____________

Restrictions

Purchase of software is restricted to departments, staff, and/or graduate students, depending on the stipulations of individual licence agreements. Most software is to be used on campus only and may also be restricted to U of T-owned machines. All restrictions are spelled out on the individual registration forms.

Completing the Registration Form

To avoid delay in processing your renewal, please ensure that you have enclosed your cheque payment, or have authorized UTCS to debit your appropriation account or UTCS Customer Account Number (CAN) by signing the registration form and giving the account number, as noted in the sample form above.

If you are buying a site licence for the first time, please make sure you have included the following items of information:

- your complete mailing address and a phone number where you can be reached during business hours;

- U of T employee number (or graduate student number, for those licences not restricted to employees);
- account number and authorized signature (if you are paying from a U of T account);
- your signature in the Conditions for Use section.

It is important to be aware of the conditions for use to which you are agreeing: that you will install the software only on the number of machines indicated on your registration form, that you will not allow any unauthorized copying to occur, and that you will use the software only for activities sanctioned by the University (in particular, that you will not make commercial use of the software). U of T effects considerable savings on your behalf by negotiating site licences at prices well below retail cost, and if the conditions for use are not met, the software manufacturers may elect to withdraw their licensing agreements with the University.

Installation of the Software

Once you have returned the completed registration form with payment to the UTCS Information Office, you should reserve a copy of the software (this usually consists of a set of floppy diskettes onto which the program has been copied). You will be asked to leave a deposit which will be refunded when you return the diskettes to the Information Office. Under normal conditions, the diskettes must be returned by 5:00 p.m. on the next working day, but special arrangements can be made for an extension. The floppy diskettes come with instructions, and should you encounter any difficulties, a UTCS staff member will be able to help you.

Tape Cartridge and Network Downloading

Some of the software is available for installation only via a tape cartridge or downloading of the software from a mainframe system. In these cases you will be put in touch directly with the technical support person for the product. Together you will arrange to install the software.

Commonly Asked Questions

Can I buy SAS outright?

Yes, for about $1,000. You have to contact the company directly.

In terms of the length of time for which you will use SAS, you will probably find it more cost effective to purchase it through the UTCS site licence agreement. For $35 annually at UTCS, you get Base SAS, Stat, Graph, and FSP.

Do I have to renew WordPerfect?

No, but you may wish to upgrade from version 4.2 or 5.0 to 5.1. The cost of the upgrade is $15. You must also give us the title page of your WordPerfect Reference Manual as proof of legal ownership. (UTCS sends these title pages to the WordPerfect Corporation in Utah.)

What is the difference between getting a new WordPerfect licence and an upgrade?

You get a new licence if you do not yet own WordPerfect. If you already own WordPerfect, then you may choose to get an upgrade, as explained above.

If my hard disk "crashes" and I lose the program, what can I do about it?

Provided you obtained the licence from UTCS, you can borrow the software and reload it onto your hard disk. Call the Information Office at 978-4990 to arrange this.

Is documentation included in the price I pay for software?

No. You must pay for this separately. If it is available at UTCS, you will see this indicated under the * column in the UTCS Site Licences section of this publication. Call the Information Office for individual prices.

Is the software mine to keep if I leave the University of Toronto?

No. Under the Conditions for Use which you have signed, the software is the property of the University and continues to be so should you leave or terminate your affiliation.

Why do I have to pay for an entire year when I am only going to use the program for three months?

The licensing of the software is negotiated and paid for on an annual basis with the manufacturer, and it is offered to you on that basis.

Why don't you have a particular licence?

UTCS licenses software which is in sufficiently wide demand to enable it to negotiate an economical price with the manufacturer. If you think a particular program should be available and know a reasonable number of users who require it, then call the Information Office.

Novell Site Licence Update

Patricia Hood
phood@vm.utcs.utoronto.ca

First the good news! NetWare 3.11 software for a 20-user local area network (LAN) is now available as part of the UTCS site licence. The prices are listed below.

20-user Licence	
NetWare 3.11	$2400
Upgrade to NetWare 3.11	$1335
Upgrade from other vendor's software	$2000
NetWare 3.0 for Mac	$400
Documentation	$176

The "bad" news is that Novell has increased, significantly, the cost of the 100-user LAN upgrade to NetWare 3.11 and we must pass the increase to you. The revised price is given in the table below. Other minor adjustments have been made in the original prices to reflect current US dollar exchange rates.

100-user Licence	
NetWare 3.11	$4670
Upgrade to NetWare 3.11	$2000*
*This is the price that increased.	
Upgrade from other vendor's software	$3336
NetWare 3.0 for Mac	$400
Documentation	$176

Information regarding purchase restrictions appears in the UTCS Site Licences section in the back of *ComputerNews*. If you are interested in upgrading your version of Novell or purchasing a new site licence, call the Information Office at 978-4990. Technical questions should be referred to Terry Sanderson at 978-4597.

New Configuration in UTCS PC Education Facility

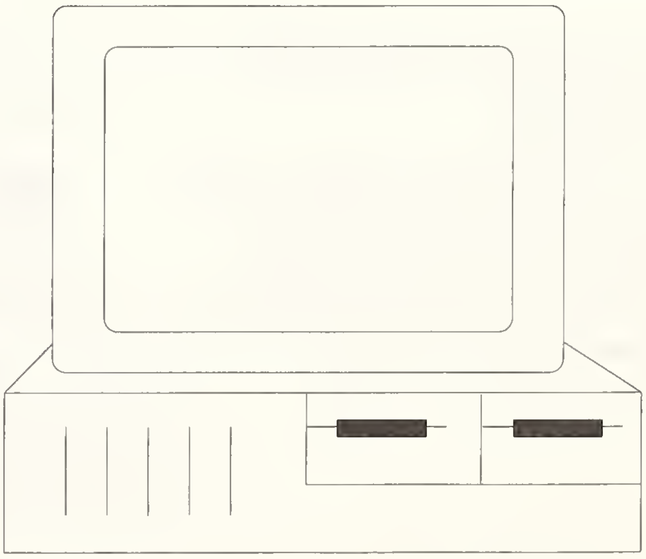
Terry Sanderson
sanders@gpu.utcs.utoronto.ca

During the Christmas holiday, UTCS upgraded its PC Education Facility. Students attending courses in 1992 will not notice any changes in the equipment that they see, but there have been major changes behind the scenes.

The AT&T equipment that was acting as a DOS file server has been replaced with UTCS's Novell NetWare file server. Each student workstation has been upgraded internally to four megabytes of Random Access Memory (RAM).

The classroom was upgraded with the intent of enhancing communications between the main file server that the instructor uses and the student workstations. Early tests indicate that performance has increased substantially (sometimes as much as 500%). What does this mean in practical terms? Applications will load faster, for one. In some courses, students are required to switch between different parts of an application to perform certain tasks. They will notice that it now takes substantially less time to make these switches. With the additional RAM the workstations are faster, so students also will be able to do more exercises.

While students will benefit immediately from these changes, these improvements also will allow UTCS to continue to offer the most advanced courses possible for the continuing benefit of the U of T community.



SPSS V4.1 under CMS Now Available

Sandra Gardner
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UTCS has recently installed SPSS V4.1 under CMS. This new version of the SPSS software supersedes the older version, SPSSx V3.1. SPSSx V3.1 will still be available until June 30, 1992, giving regular users of this version time to make the transition to SPSS V4.1.

No file conversions are required to run SPSSx V3.1 command files under SPSS V4.1. The default CMS filetype for SPSS system files has been changed from SPSSXFIL to SPSSFILE, but the new version still recognizes the SPSSXFIL filetype.

Both versions of the SPSS software contain the Base, Advanced Statistics, and Tables modules, but several new procedures have been added to SPSS V4.1. EXAMINE allows you to look at data before analysis; FLIP transposes data matrices; MATRIX is a matrix transformation language for writing your own statistical procedures; and LOGISTIC REGRESSION is used for logistic regression analysis.

LISREL and PRELIS

LISREL, the add-on option for analysis of linear structural relationships, is also available in both versions (LISREL versions 6.13 and 7.16, respectively). SPSS V4.1, however, includes PRELIS, a preprocessor for LISREL. PRELIS improves the analysis of categorical, continuous, and incomplete data.

The syntax for invoking LISREL within SPSS has been modified for SPSS V4.1. The LISREL command replaces the USERPROC NAME=LISREL command. LISREL subcommands have syntax similar to SPSS subcommands. *Figures 1* and *2* provide an example of a LISREL analysis for SPSSx V3.1 and SPSS V4.1, respectively. In SPSS V4.1, output files and matrices generated by LISREL may be named by the user like other SPSS generated files (see the OU subcommand in *Figure 2* on the next page).

If you are entering raw data for your analysis, it is recommended that you create an SPSS (active) system, then use the PRELIS procedure to produce a matrix system file which will be used by the LISREL procedure. *Figure 3* (next page) lists a sample command file for this process. Please see the *SPSS LISREL 7* and *PRELIS User's Guide and Reference* for further details.

Manuals

See *Figure 4* on the next page for a list of the current documentation. Manuals may be purchased at the University of Toronto Bookstore.

How to Access the SPSS Software under CMS

To access either version of SPSS, you must have an active UTCS CMS account. Familiarity with the CMS

```
TITLE SPSSX V3.1, LISREL V6.13 : MATRIX INPUT OF DATA
INPUT PROGRAM /* CREATING AN ACTIVE FILE
NUMERIC DUMMY
END FILE
END INPUT PROGRAM
USERPROC NAME=LISREL /* INVOKING LISREL
THIRD  LAST
DA NI=6 NO=134 MA=KM
LA
'RWTHNK' 'RWWISH' 'RWTRYS' 'DTWSH' 'DTHTNK' 'DTHTRY'
KM
1.000
0.558 1.000
0.391 0.351 1.000
0.219 0.361 0.152 1.000
0.321 0.228 0.064 0.425 1.000
0.327 0.297 0.004 0.230 0.512 1.000
SD
1.888 1.955 1.119 1.522 1.261 1.060
MO NX=6 NK=1 LX=FU,FR
FI LX(1,1)
VA 1.0 LX 1 1
OU TV SE RS TO MA=21
END USER
FINISH
```

Figure 1

computing environment and XEDIT is an asset. (If you wish to open an account, please call the UTCS Accounting Office at 978-7148.)

Issue the CMS GETME command to access the version you wish to use. GETME SPSS or GETME SPSSX will access SPSSX V3.1, and GETME SPSS NEW or GETME SPSSX NEW will access SPSS V4.1. You may run a prompted SPSS session by issuing the SPSS or SPSSX command followed by a space, followed by an asterisk (*). Batch programs may be run using the SPSS or SPSSX command followed by the filename. (It is preferable to use the GETME SPSS NEW and SPSS commands since the 'x' has been dropped from the product name and most of the current SPSS documentation reflects this change.)

Online help is available for prompted sessions. The SPSS INFO command provides updates and corrections to the SPSS manuals. For further details see the *SPSS for IBM CMS: Operations Guide* or the *SPSS Reference Guide.*

SPSS/PC+

UTCS also has a site licence for SPSS/PC+ V4.0.1. The PC package has the same modules as SPSS V4.1, with the exception of LISREL and PRELIS. Additional modules, such as Trends, Categories, Data Entry, and a Graphics module that contains an interface to other graphics packages, are also part of the SPSS/PC+ site licence. If you are interested in obtaining a copy of SPSS/PC+ for your own machine, please call the Information Office at 978-4990 for licensing details.

If you have any questions about SPSS, please call Sandra Gardner at 978-5128.

```
TITLE SPSS V4.1, LISREL V7.16 : MATRIX INPUT OF DATA
INPUT PROGRAM /* CREATING AN ACTIVE FILE
NUMERIC DUMMY
END FILE
END INPUT PROGRAM
LISREL
  /"THIRD  LAST"
  /DA NI=6 NO=134 MA=KM
  /LA
  /'RWTHNK' 'RWWISH' 'RWTRYS' 'DTWSH' 'DTHTNK' 'DTHTRY'
  /KM
  /1.000
  /0.558 1.000
  /0.391 0.351 1.000
  /0.219 0.361 0.152 1.000
  /0.321 0.228 0.064 0.425 1.000
  /0.327 0.297 0.004 0.230 0.512 1.000
  /SD
  /1.888 1.955 1.119 1.522 1.261 1.060
  /MO NX=6 NK=1 LX=FU,FR
  /FI LX(1,1)
  /VA 1.0 LX 1 1
  /OU TV SE RS TO MA='MATRIX OUTPUT A'
FINISH
```

Figure 2

```
TITLE SPSS V4.1, PRELIS, LISREL V7.16 : RAW DATA INPUT
DATA LIST FILE='RAW DATA' FREE /1 VAR1 VAR2 VAR3 VAR4
PRELIS
  /VARIABLES=VAR1 TO VAR4
  /MATRIX=OUT (*)
  /TYPE=COVARIANCE
LISREL
  /MATRIX=IN (*)
  /DA NI=4
  /MO NX=4 NK=1 LX=FR PH=ST
  /OU
FINISH
```

Figure 3

Module	**Current Manuals**
All	*SPSS for IBM CMS: Operations Guide* *SPSS Reference Guide*
Base	*SPSS Base System User's Guide*
Advanced Statistics	*SPSS Advanced Statistics User's Guide*
Tables	*SPSS-X Tables, Second Edition*
LISREL, PRELIS	*SPSS LISREL 7 and PRELIS User's Guide and Reference* *LISREL 7: A Guide to the Program and Applications, 2nd Edition*

Figure 4

Maple Corner

News for Maple Users at U of T

Instructional Materials from Waterloo Maple Software

Andrzej Pindor
pindor@gpu.utcs.utoronto.ca

University of Toronto Computing Services is a major site licence holder for Maple software. We have various materials which may be of interest to Maple users. Please watch USENET's "ut.general" newsgroup for up-to-date information. I recently received the following items:

- *The Maple ROOTS Report: The Newsletter from Waterloo Maple Software*, vol. 1, #2;
- The *Maple Technical Newsletter*, #6, Fall 1991;
- "New Features That Have Been Added to Maple V", by Symbolic Computation Group, Dept. of Computer Science, University of Waterloo;
- "Maple V: A Sample Interactive Session", by Symbolic Computation Group, Dept. of Computer Science, University of Waterloo;
- "Teaching Calculus with Maple", by J.S. Devitt;
- "Computer Algebra in the Undergraduate Mathematics Classroom", by B.W. Char, K.O. Geddes, G.H. Gonnet, B.J. Marshman, and P.J. Ponzo;
- "Maple for Engineering Design and Analysis", by T. Lee and G.P. Porciello;
- "Unleashing Computer Algebra on the Mathematics Curriculum", by J.S. Devitt;
- "List of Maple Publications", by members of the Symbolic Computation Group.

If you are interested in looking at any of the above, please contact Andrzej Pindor at 978-5045 or through electronic mail at *pindor@gpu.utcs.utoronto.ca*.

New Maple Implementations

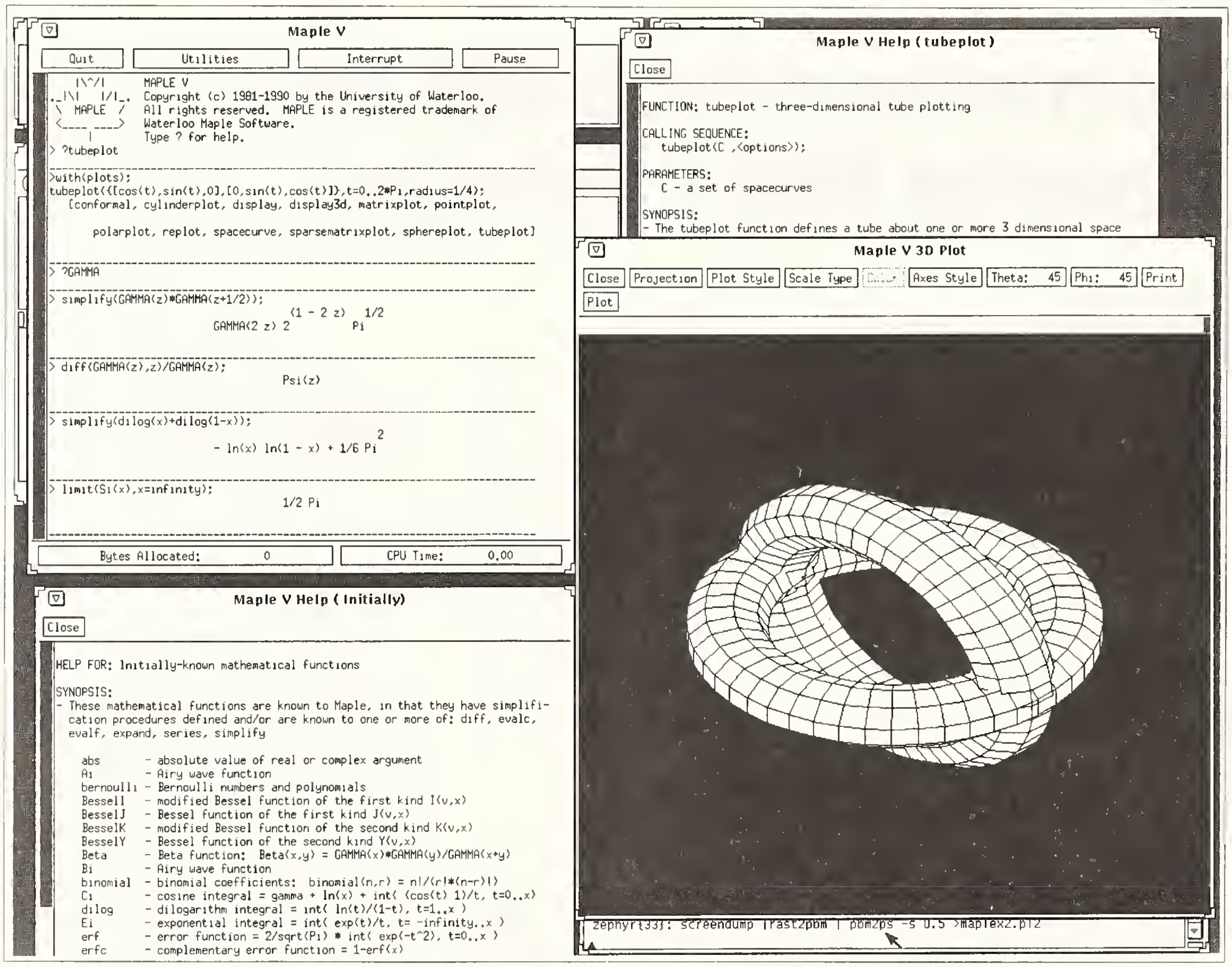
Waterloo Maple Software continues to release versions of Maple for different computing environments. Recently I received Maple V for the Amiga running DOS, and for DEC VAX running VMS. By the time you read this, Maple will be available for NeXT computers. In early spring an implementation for 386/486 machines running under Windows is scheduled for release. We will receive these new implementations when they are available.

System-specific Interfaces in Maple V

Maple V implementations for various platforms take advantage of system-specific features to create user-friendly interfaces. On UNIX machines you have a choice between a simple, teletype (TTY) interface (the original way of using Maple) and an X-windows interface. *Figure 1* (next page) shows a Maple session running under X windows.

In the main Maple window (top left-hand corner) you can see four buttons. Quit, Interrupt, and Pause have obvious meanings. The Utilities button, on the other hand, opens up a submenu which allows you to include a file, save text into a file, and set several Maple window attributes. With these attributes, you can choose to insert (or not) separators between each command output pair; replace output (see below); set the Return key to work as a command key; and turn Indent Mode on and off.

To rerun one of the commands with modifications, move the cursor to the corresponding line and make



```
   |\^/|     MAPLE V
._|\|   |/|_. Copyright (c) 1981-1990 by the University of Waterloo.
 \  MAPLE  /  All rights reserved.  MAPLE is a registered trademark of
 <____ ____>  Waterloo Maple Software.
      |       Type ? for help.
> ?tubeplot
--------------------------------------------------------------------------
>with(plots);
tubeplot({[cos(t),sin(t),0],[0,sin(t),cos(t)]},t=0..2*Pi,radius=1/4);
   [conformal, cylinderplot, display, display3d, matrixplot, pointplot,

       polarplot, replot, spacecurve, sparsematrixplot, sphereplot, tubeplot]

--------------------------------------------------------------------------
> ?GAMMA
--------------------------------------------------------------------------
> simplify(GAMMA(z)*GAMMA(z+1/2));
                                 (1 - 2 z)   1/2
                    GAMMA(2 z) 2            Pi

--------------------------------------------------------------------------
> diff(GAMMA(z),z)/GAMMA(z);
                              Psi(z)

--------------------------------------------------------------------------
> simplify(dilog(x)+dilog(1-x));
                                             2
                    - ln(x) ln(1 - x) + 1/6 Pi

--------------------------------------------------------------------------
> limit(Si(x),x=infinity);
                              1/2 Pi

--------------------------------------------------------------------------
Bytes Allocated:        0          CPU Time:        0.00
```

```
FUNCTION: tubeplot - three-dimensional tube plotting

CALLING SEQUENCE:
   tubeplot(C ,<options>);

PARAMETERS:
   C - a set of spacecurves

SYNOPSIS:
- The tubeplot function defines a tube about one or more 3 dimensional space
```

```
HELP FOR: Initially-known mathematical functions

SYNOPSIS:
- These mathematical functions are known to Maple, in that they have simplifi-
  cation procedures defined and/or are known to one or more of: diff, evalc,
  evalf, expand, series, simplify

    abs        - absolute value of real or complex argument
    Ai         - Airy wave function
    bernoulli  - Bernoulli numbers and polynomials
    BesselI    - modified Bessel function of the first kind I(v,x)
    BesselJ    - Bessel function of the first kind J(v,x)
    BesselK    - modified Bessel function of the second kind K(v,x)
    BesselY    - Bessel function of the second kind Y(v,x)
    Beta       - Beta function:  Beta(x,y) = GAMMA(x)*GAMMA(y)/GAMMA(x+y)
    Bi         - Airy wave function
    binomial   - binomial coefficients:  binomial(n,r) = n!/(r!*(n-r)!)
    Ci         - cosine integral = gamma + ln(x) + int( (cos(t) 1)/t, t=0..x)
    dilog      - dilogarithm integral = int( ln(t)/(1-t), t=1..x )
    Ei         - exponential integral = int( exp(t)/t, t= -infinity..x )
    erf        - error function = 2/sqrt(Pi) * int( exp(-t^2), t=0..x )
    erfc       - complementary error function = 1-erf(x)
```

```
zephyr{33}: screendump |rast2pbm | pbm2ps -s 0.5 >mapleX2.pl2
```

Figure 1

the modifications. When you press the Return key the command is rerun. If the "Replacing Output" attribute is turned on, the old output will be replaced by the new one (a good choice if you have made a mistake). If the "Replacing Output" attribute is turned off, the new output will appear above the old one.

When you invoke help, a new window that contains help information appears. You can have several help windows open simultaneously, and you can copy example commands from a help window to the main window and run them.

The results of graphics commands appear in a separate window. You can see this in the lower right-hand corner of *Figure 1*. You also see that this three-dimensional plot

window contains a number of buttons for manipulating and customizing the graph.

The main window shows some examples of Maple's special functions. You can also obtain the values of these functions at any argument by using the "evalf" command.

On Sun workstations, you can also use the SunView interface. *Figure 2* shows Maple's main window under SunView. Note the additional buttons. The Help button, in particular, makes consulting help very easy. When you press the Help button, a submenu with names of different categories of commands, like "standard", "mis" (miscellaneous commands), "linal" (linear algebra), "plot" (special plotting routines), and so on, appears. For each of these items you can open another submenu containing specific commands. Choosing any of these opens a new window with explanatory text.

The Clear button clears the contents of the Maple window. Print sends the contents of the main window to a default printer. Calling a plotting procedure opens a new window with a graph. An example of a parametric graph is shown in *Figure 3*. This figure was created by using the Save button from the graphics window (an illustration of the graphics window for the SunView interface appeared in a previous issue of *ComputerNews*).

Maple Corner will be a regular feature in *ComputerNews*. Don't forget to pick up the next issue to learn about new developments in Maple software.

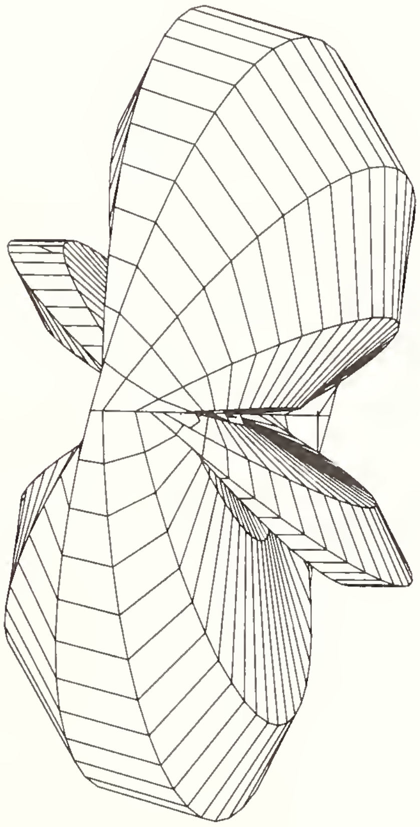
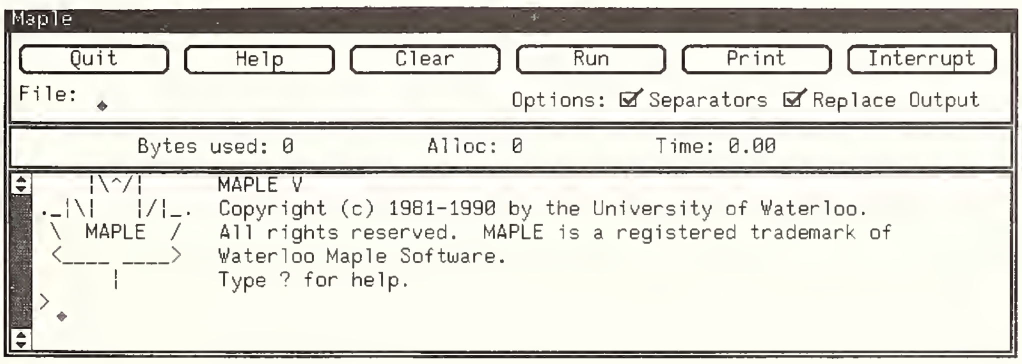


Figure 3: An example of a parametric graph.

Figure 2: Maple's main window.



File:

Options: ☑ Separators ☑ Replace Output

Bytes used: 0 Alloc: 0 Time: 0.00

```
    |\^/|     MAPLE V
._|\|   |/|_. Copyright (c) 1981-1990 by the University of Waterloo.
 \  MAPLE  /  All rights reserved.  MAPLE is a registered trademark of
 <____ ____>  Waterloo Maple Software.
      |       Type ? for help.
>
```

Numerical & Scientific Software Updates

Andrzej Pindor
pindor@gpu.utcs.utoronto.ca

CHICO SOLVER Version 2.3

CHICO Software Company recently released version 2.3 of CHICO SOLVER, a software package for solving equations. I reviewed previous releases in issues 265 and 270 of *ComputerNews*.

The newest version contains a number of enhancements which make it more powerful and friendlier to use. Most interestingly, version 2.3 now includes three new global optimization methods, in addition to the usual local optimization method (a modified version of Powell's method). The global optimization methods are random search, simulated evolution, and simulated annealing. The last two methods are relatively new (simulated evolution is, perhaps, better known as a genetic algorithm), so they might be unfamiliar to many users. The descriptions of the methods in the manual are very brief, so it would be helpful if the authors supplied a list of supplementary readings that provide more detailed information.

Other enhancements to CHICO SOLVER include much better user control over the parameters of various operations (solving procedure, integration, and optimization), and the way in which numbers are presented (number of significant digits, exponential notation, and truncation of small values). You now have some control over the colours used for the display of all aspects of the CHICO SOLVER screen. However, printer support is still weak. Only dot matrix printers, the Hewlett-Packard LaserJet, and the Hewlett-Packard Graphics Language (HPGL) plotter are supported.

Isolation and ordering of equations are now faster. Output (including error messages) is now more informative. According to information provided by the vendor, some large systems of equations now can be solved over 100 times faster.

Version 2.3 comes with several macros that were developed for the demonstration version of the program. These macros run a series of brief tutorials, which serve as a good introduction for beginners.

If you frequently have to solve systems of equations, from sets of linear equations to differential systems, you might find that CHICO SOLVER is a better choice than a more general package.

I would like to acknowledge the courtesy of CHICO Software Company for providing a complimentary copy of version 2.3 of CHICO SOLVER.

To examine the program or to obtain more information about it, please call Andrzej Pindor at 978-5045.

Hardware Requirements:
IBM PC/AT or compatible, at least 512KB of RAM.
80x87 coprocessor and hard disk recommended.

Vendor:
CHICO Software Company
142 West Second Street
Chico, CA 95927-5174
USA
(916) 342-EASY

Price:
US$399 full version
US$45 student version
(Volume discounts are also available.)

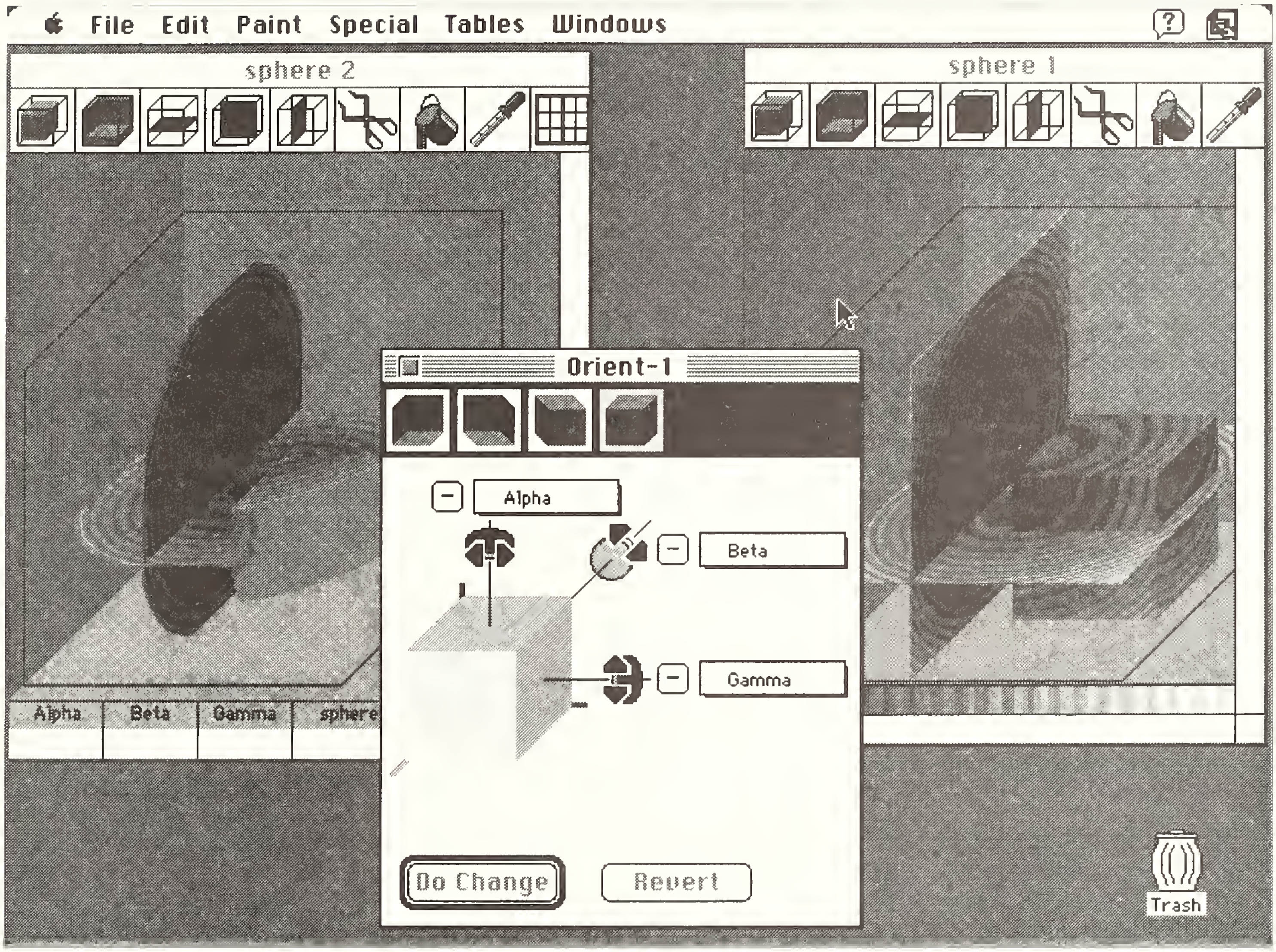


Figure 1: Two different views of a sphere showing slices, cutouts, and a solid block. The window in the middle is used for rotating images. Note the names of the dimensions which can now be changed by the user.

Spyglass DICER

Spyglass, Inc. has released version 1.1 of their visualization program, DICER. DICER is used to visualize volume data. I reviewed the original version of the program in the January/February 1991 issue (#268) of *ComputerNews*.

Version 1.1 has the following new features:

Data Input/Output

You can now save configurations in a file, so when you reopen the file the same slices, cubes, cutouts, and colours appear. You can specify a file's header and trailer bytes to be skipped when reading the file. You can change the names of each dimension (and variable names). These changes will be saved in a configuration file. You can modify and save actual data, as opposed to the view of the data.

Image Output

Various types of image output are available to you. You can save a screen image as a PICT file. You can also generate three different types of animation: slices animation, by generating and saving sequences of two-dimensional slices; space animation, by generating and saving sequences of three-dimensional (3D) configurations where an object moves through the datacube; and time animation, by stepping a 3D configuration through a fourth dimension.

Visualization

For interpolation of images, you can choose between linear (smoothed) and nearest neighbour ("chunkier") interpolation methods. A series of selected slices can be distributed uniformly. All voxels within a datacube can be activated, thus creating a solid fill.

The program comes with an examples diskette that contains some test data (different images of a sphere), a file of actual data (time dependent 3D hydrodynamic simulation of a narrow angle tail radio jet), and two examples of animation. *Figure 1* shows two different views of the test data.

I would like to acknowledge the courtesy of Spyglass, Inc. for providing me with a complimentary copy of version 1.1 of DICER. If you are interested in examining the program, call Andrzej Pindor at 978-5045.

Hardware Requirements:
Macintosh II series computer, equipped with 256 colour capability, 2MB of RAM (4MB recommended). Hard disk highly recommended. You must have system software version 6.0.3 or higher and must install 32-bit QuickDraw (which is included).

Price:
US$249

DERIVE Version 2:

A Brief Review of New Features

In the May/June 1991 issue of *ComputerNews* (#271) I included a short note about version 2 of DERIVE, describing its most interesting new features based on a product announcement supplied by the vendor. (A review of an early version of DERIVE appeared in the March 1989 issue of *ComputerNews* and a report on enhancements to it appeared in the January/February 1990 issue.) The vendor has since provided a complimentary copy of version 2, so I can report more thoroughly on how the product works.

As mentioned in the most recent article, DERIVE's new programming capability is a welcome addition. Programming attributes include:

- if-then-else conditional construct with an indeterminate result clause option;
- logical (AND, OR and NOT) and relational (=, <, /=, etc.) operators for use as conditionals;
- recursive and mutually recursive function definitions;
- two general-purpose iteration programming constructs.

Other Areas with Considerable Enhancements

In addition to the new programming environment, DERIVE has been enhanced or improved in many other areas. Following is a brief overview of features that have been changed.

Equation Solving

- improved exact algebraic solving of equations involving trigonometric and transcendental functions;
- approximate solutions to equations with complex roots;
- numeric solutions to systems of nonlinear algebraic equations using Newton's or a fixed-point method.

Matrix Operations

- extract the minors of a matrix and pivot on matrix elements using elementary row and column operations;
- matrix products and inverses of matrices too large to fit into memory;
- exact or approximate computation of the eigenvector of a matrix corresponding to a given eigenvalue.

Calculus

- larger class of expressions for which a closed-form symbolic integral can be found;
- explicit integration by parts or by substitution;
- functions for finding tangent planes and normal lines to implicitly defined surfaces;
- Laplace transforms and truncated Fourier series approximations.

Numerical Methods

- Riemann sum integral approximations;
- numerical solutions to systems of ordinary differential equations;
- smoothing, differentiation, and integration of numeric data;
- approximate first and second order partial derivatives of expressions.

Plotting

- plot and rotate space curves such as helixes;
- plot parametrically defined surfaces (no hidden line removal in this case, though);
- plot expressions that have complex values using rays or arcs;
- separately zoom the x-axis or y-axis in or out using a single function key.

New Files

DERIVE's built-in capabilities are enhanced by over 200 functions and variables that are defined in 23 utility files, many of them made possible by the new programming capabilities. Limited space prohibits publishing all of them, so following is a list of the files that enhance mathematical capabilities:

SOLVE.MTH	Solving nonlinear systems and complex solutions;
NUMERIC.MTH	Numerical differentiation and integration;
ODE1.MTH	First-order ordinary differential equations;
ODE2.MTH	Second-order ordinary differential equations;
ODE_APPR.MTH	Approximately solves ODEs;
APPROX.MTH	Pade rational approximation.

There are also several demonstration files which you can use to examine DERIVE's capabilities.

Conclusions

Generally speaking, the addition of programming capabilities eliminates DERIVE's only serious deficiency. You must keep in mind, however, that it is still a very small program (it needs only 512 kilobytes of Random Access Memory), so you cannot expect it to be powerful enough for heavy work. If you have modest requirements it is extremely capable. DERIVE's algorithms are very well thought out, often better than the ones you see in the heavy-duty Computer Algebra Systems (CAS). The program's friendly interface is an additional bonus. If you would like to examine DERIVE 2, you are welcome to call Andrzej Pindor at 978-5045.

Vendor:
Soft Warehouse Inc.
3615 Harding Ave., Ste. 505
Honolulu, Hawaii 96816
USA

System Requirements:
IBM PC, XT, AT, PS/2 or compatible running MS-DOS version 2.1 or later; one of the following display adapters: MDA, CGA, EGA, VGA, Hercules or compatible; minimum 512KB of RAM (DERIVE can use up to 640KB); at least one double-sided floppy disk drive. There is also a version of DERIVE for NEC PC-9801 personal computers.

Mfg. Sugg. Price:
US$250

Microcomputer Short Courses

Irene Rosiecki
rosiecki@vm.utcs.utoronto.ca

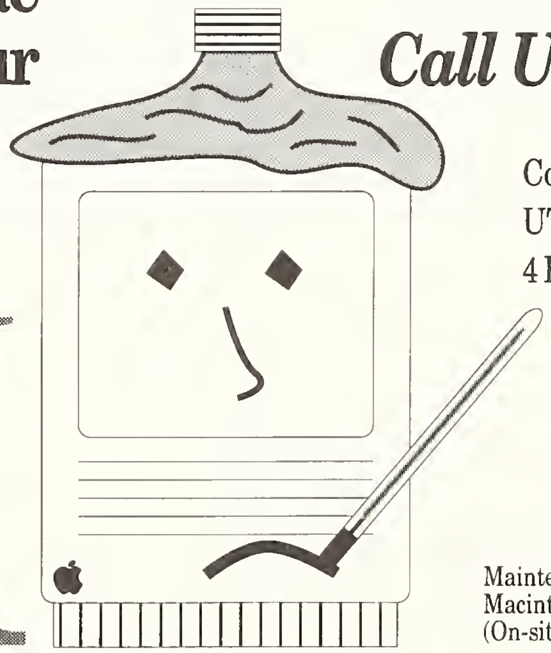
UTCS offers various noncredit microcomputer courses to faculty, staff, and graduate students of the University of Toronto. These courses cover a number of software programs available for the PC or the Macintosh. Whether you will be typing a thesis on a word processor, or working with spreadsheets, databases, or desktop publishing, we may be able to help you get started.

Our class sizes are small to allow for much individual attention. In most cases, continuing support is available upon completion of a course.

The following is a list of the microcomputer courses taught at UTCS:

- Introduction to dBASE IV
- Introduction to Disk Operating System (DOS)
- Electronic Mail Seminar
- Excel on the Macintosh
- Introduction to FoxBASE+/Mac 2.0
- Introduction to HyperCard
- Introduction to Lotus 1-2-3
- Introduction to PageMaker
- ProComm Communications Seminar
- Introduction to SAS on the PC
- Intermediate SAS - Data Processing
- Intermediate SAS - Statistics
- SAS/Graph Seminar
- Microsoft Word on the Macintosh
- Introduction to WordPerfect 5.1
- Advanced WordPerfect 5.1 Topics

To find out about course dates and registration procedures, or to book a place in any of these courses, please contact Irene Rosiecki at 978-4565. Courses are filled on a first-come, first-served basis. The more popular courses fill up quickly, but waiting lists are maintained in case of cancellations.



When your Mac is sick and your temperature's rising...

Rx

Call UTCS Apple Care

Conveniently located at the
UTCS Apple Repair Centre
4 Bancroft Avenue, Room 103

978-1506
or
978-5050

Maintenance contracts, repairs, and upgrades for Macintosh computers and Apple Printers.
(On-site or Depot Servicing)

1991 INDEX

January/February 1991 Issue No. 268

Comdex Fall 1990 ... 1

Computing & Communications News

  - What We've Been Doing ... 5
  - NCRIPTAL/Educom Software Awards ... 5

Scientific Visualization Software

  - PV~WAVE ... 6
  - NCSA DataScope ... 8
  - NCSA Image ... 10
  - Spyglass TRANSFORM ... 11
  - Spyglass VIEW ... 11
  - Spyglass FORMAT ... 11
  - Spyglass DICER ... 11

How to Analyze Repeated Measures Designs Using SYSTAT ... 13

Authoring Systems for the IBM Microcomputer

  - Linkway ... 19
  - ToolBook ... 20

DeltaGraph: Mac Charting for Science and Business ... 22

Atari Portfolio ... 24

March 1991 Issue No. 269

Printer Sharing on PCs ... 1

True Colour and Video on the Macintosh ... 5

UTour: An Interface for Educational Material at the University of Toronto ... 7

Reprints Available ... 9

Producing the Perfect Paragraph ... 10

Macworld Expo 1991, San Francisco ... 14

Postage Not Required if Mailed on Campus ... 17

How to Analyze Repeated Measures Designs Using SPSS ... 19

Theorist: Symbolic Manipulation Software for the Macintosh ... 24

More Software to Help You with Chaos ... 28

RPlot™ : A Simple and Inexpensive 2D Graphics Program ... 30

April 1991 No. 270

PlotTool: Interactive Interface to Mathematics Graphics Under SUNView ... 1

SPSS/PC News ... 4

NAg FORTRAN Library Mark 14 ... 5

CHICO Solver Update ... 6

A Step Towards Windows: Microsoft Word 5.5 ... 7

CorelDRAW 2.0 ... 10

WordPerfect Licences Now Cost Less! ... 12

Computing & Communications News

  - Telephone Tips ... 14
  - UTCS Microcomputer Course Descriptions ... 15

1991 INDEX

MAY/JUNE 1991 No. 271

CSUN Conference: Technology for Persons with Disabilities 1
National Net '91 Conference Report 5
SUGI's 16th Annual Conference 8
New SAS 6.06 Manuals for Sale 9
Changes in Site Licence Prices 10
CQUEST: Computing for the Future 11
Computing & Communications News
    Telephone Tips 13
    Annual Report 13
Packard Bell PACK-MATE 386-XH 14
Packard Bell Force 386/33 16
NEC PC-VCR 19
What's New in PageMaker 4.0 for the PC? 21
MacKermit version 0.98(62) Now Available at UTCS 24
EasyPlot—Scientific Plotting and Data Analysis Program 26
SYSTAT News 29
Scientific Software Updates
    DERIVE Version 2 30
    New from MathCAD 30
NAg FORTRAN Library Mark 14 Implemented on the CMS System 31

JULY/AUGUST 1991 No. 272

National Net '91 Conference Part 2: The Human Genome Project 1
Say it with Style! in Word on the Mac 3
Outlining in Style 9
Adobe Illustrator 3.0 11
Colour Scanners 14
Update on Anti-virus Efforts at UTCS 16
The Z386/33E and Z386 SX from Zenith 17
Computing & Communications News
    Security and Voice Mail 23
    Information Security at the University of Toronto 24
Spyglass TRANSFORM Update 25
Chaos Again: A New Version of the Dynamics Program 26
Reminder of Site Licence Renewals 26

1991 INDEX

SEPTEMBER/OCTOBER 1991 — No. 273

Let's Talk About It: Reorganization 1
Advising and Consulting at UTCS 2
UTCS Organization Chart 3
Computing & Communications News
  The University of Toronto Telephone Directory 4
  UTCC on the Move 4
Documents With Style in WordPerfect 5.1 for the PC 5
Introduction to the INTERNET 9
The Typist Hand-held Scanner for the PC 10
IBM M-Motion Video Adapter 16
Commodore SL 386SX 20 17
dBASE IV 1.1: A Good Combination of Interactive & Application Development Tools 20
DOS 5.0 22
PageMaker 4.01 26
Statistical Software Updates
  SYSTAT News 28
  SAS/PC News 28
Campus-wide Licence for IMSL Products 28
Genetic Algorithm Workbench 30
Scientific Software Survey 31
Microcomputer Scientific Software at UTCS 32

NOVEMBER/DECEMBER 1991 — No. 274

New Directions at UTCS 1
UTCS Organization Chart 1
ComputerNews Publishing Schedule 1
Facility Management Support 2
Computer & Network Operations Support 5
Network Development & Support 6
Systems Support 10
User Support Services 11
Administrative & Information Services 17
UTCS Noncredit Microcomputer Courses 1992 New Year Schedule 20
Computing & Communications News
  Protecting Your PC or Mac Against Computer Viruses 21
  C&C Newsletter Makes it Debut 22
Maple Software Available at U of T 23
Statistical Software News
  SAS/PC 26
  SPSS 26
  SYSTAT 26

UTCS Services

Facilities Managed by UTCS

Administrative Computing
- administrative ORACLE, IMS, DB2, TS0, Batch
- 3081K processor, 48 megabytes of memory
- MVS/XA operating system

Computer Disciplines Facility/PC
- 88 NEC computers connected in a Local Area Network:
  •Robarts Library (Rm. 1061A): 36 NEC PCs
  •St. Michael's College (Rm. 107): 26 NEC PCs
  •Sidney Smith (Rm. 1071): 23 NEC PCs
  •Trinity College (Rm. 024): 3 NEC PCs
- MS-DOS with Turing environment
- introductory computer science

Computers in Quantitative and Empirical Science Teaching (CQUEST)
- 52 DEC VT1000 X Window terminals, 20 DEC 2100 workstations connected in Local Area Network:
  •Ramsay Wright (Rm. 211, 213): 29 DEC VT1000s, 10 DEC 2100s
  •Sidney Smith (Rm. 2105): 20 DEC VT1000s, 10 DEC 2100s
  •Departmental use: 3 DEC VT1000s

Public Sites
- 50 XT100 terminals connected to PACX
  •Robarts Library (Rm. 1061A): 24 terminals
  •Engineering Annex (Rm. 107B): 12 terminals
  •St. Michael's College (Rm. 107): 9 terminals
  •Victoria College (1st floor): 3 terminals
  •Trinity College (Rm. 024): 2 terminals

Erindale College Systems
SUN 3/280, 16 megabytes of memory
- instructional and research access using UNIX

VAX 8200, 8 megabytes of memory
- instructional access using VMS
- research access

Institutional Relations System
VAX-11/750, 8 megabytes of memory
- database services to the owner departments using VMS

Ontario Centre for Large Scale Computation (OCLSC)
- Cray Research Inc. X-MP/28
- 2 processors, 8 megawords main memory
- solid state disk (SSD) with 64 megawords of storage
- UNICOS 5.1.11 operating system
- VAX 8350, MicroVAX-II, VAXstation 3200, and SUN-3/280 provide front-end services

> *The mission of Computing and Communications (UTCC) is to provide services, facilities, and expertise that ensures that the University of Toronto is a leader in the cost-effective utilization, management and evolution of information technology in support of the research, teaching, library, and administrative goals of the University.*

UTCS Centrally Owned and Managed

Systems

IBM VM/CMS
Technical Assistance: 978-6602
- General Purpose Timesharing environment
- Hub of the NetNorth network with access to BITNET, EARN and the Internet
- 4381-R03 processor with 32 megabytes of memory
- CP operating system, VM/SP HPO R6
- CMS timesharing system, VM/SP Release 6
- FTP and TELNET access to the campus Ethernet, as well as Internet
- RSCS spooling system, Release 2.3

GP UNIX
Technical Assistance: 978-8853
- General Purpose Timesharing under SUN UNIX 4.1.1
- SUN 4/490, 32 megabytes ot memory
- access to Linotronic typesetter
- full access to USENET, an electronic technical information exchange facility
- full access to the Internet, UUCPNET, BITNET, CDNNET

Services

Facility Management Support
Primary Phone: 978-5050
- Installs, maintains and upgrades microcomputer systems, particularly Macintoshes, IBM PCs and compatibles on a contract basis or on a cost-per-call basis.

Network Development & Support
Primary Phone: 978-7087
- Communications Group provides communications systems, terminals, modems, data channels: consulting and installation.
- provides access between the IBM systems and machines using UNIX, VMS, and other operating systems. Ethernet, Pronet, and IBM TRN technologies are used over various transmission media including optical fibre. More basic communications techniques are also used for moderate speed links.
- provides consulting on local area networking
- provides access to NetNorth (BITNET), the North American Universities Network; ONET, the Ontario Regional Network; CA*net, the Canadian National Network; and USENET, the UNIX networking fraternity
- will provide a communications solution to department needs on a contractual basis

User Support Services
Advising and Consulting
Primary Phone: 978-HELP
- The Advising and Consulting group is available to University faculty, staff, and graduate students.
- provides phone-in advising, and consultations by appointment for the following products:
  - operating systems: DOS, Macintosh System & Finder
  - packages and libraries: SAS, SPSS, SYSTAT
  - word processors: WordPerfect, Microsoft Word
  - databases: dBASE IV, FoxBASE
  - spreadsheet: Lotus 1-2-3, Microsoft Excel
  - file transfer: ProComm, MacKermit
  - electronic mail: QuickMail

Information Technology Support
Primary Phone: 978-5601
- selection consulting for hardware and software
- Micro Lab for evaluation of hardware and software
- CD-ROM access to software and information discs
- offers phototypesetting service

Administration and Information Services
Primary Phone: 978-4462
- administers Local Area Network of PCs for Education Facility
- administers Macintosh Education Facility
- administers site licences for various software packages
- provides short courses and seminars on the more popular services and software packages
- provides accounting services for all UTCS services
- provides accounting services for the University's telephone system on behalf of the Voice Communications Department
- produces *ComputerNews* and the UTCC newsletter

Telephone Listings

Consulting and Enquiries

Account & Access Code Enquiries	Jason Pante	BC101B	978-7148
Communication, Networking & Hardware	Rosi Derka-Tseu	BC105	978-7087
Erindale College	Joe Lim	ER2035	828-5311
IBM & Macintosh Maintenance	Rosi Derka-Tseu	BC103	978-1299
Information Office / Site Licences	Evelyn Ward	BC201	978-4990
Tape Library (Academic Services)	Susan Kovago	MP368	978-7319
Tape Library (Administrative Services)	Miranda Fong	MP368	978-6693
UTCS Noncredit Short Courses	Irene Rosiecki	BC217	978-4565

Consulting & Advising Services:	978-HELP
CMS, and GP UNIX userids:	ADVISOR
CMS Userid for mail problems:	POSTMSTR
Network Operations Centre	978-4621
System Status Enquiries (GP UNIX)	978-4318
System Status Enquiries (IBM)	978-7393
Interactive Services 300 (bps)	978-3959
Interactive Services 1200 (bps)	978-3959
Interactive Services 2400 (bps)	978-7239
Interactive Services 9600 (bps)	978-7220

UTCS Directory

Management Office General Enquiry				978-4462
Director:	Dr. Warren Jackson	BC118	978-8948	wcj@vm.utcs.utoronto.ca
Associate Director, Operations:	Eugene Siciunas	BC116	978-5058	eugene@vm.utcs.utoronto.ca
Managers:				
Computer & Network Operations Support	Dr. Bob Chambers	MP350	978-7092	
Systems Support	Bill Lauriston	MP350	978-3579	bill@vm.utcs.utoronto.ca
Facility Management Support	Vera Cabanus	BC312A	978-7107	vcabanus@gpu.utcs.utoronto.ca
User Support Services	Don Gibson	BC312	978-7331	gibson@utcs.utoronto.ca
Network Development & Support	Norman Housley	BC121B	978-4967	norman@vm.utcs.utoronto.ca
Administration & Information Services	Ron Vander Kraats	BC121A	978-4428	rvk@vm.utcs.utoronto.ca

Legend:
BC = Bancroft Building
ER = Erindale
MP = McLennan Physical Labs

* NetNorth/BITNET/EARN

Terminal & Advising Sites

Names and Locations

Central Advising Office (CAO), 978-HELP
Engineering Annex (EA), 11 King's College Road, Room 107B
Erindale College (Erin), 828-5339, 3359 Mississauga Road North, Erindale Campus, Rooms 2037, 2045
Ramsay Wright, 25 Harbord St., Rooms 211, 213
Robarts, Robarts Library, 130 St. George St., Room 1061A
Sidney Smith (Sidney), 100 St. George St., Room 1071, 2105
St. Michael's College, 121 St. Joseph St., Room 107
Trinity College, 6 Hoskin Ave., Room 024
Victoria University, 73 Queen's Park Cres., 1st floor

Access Hours

Sites	Hours of Access				Restrictions*	Advising
	Mon-Thurs	Fri	Sat	Sun		
CAO	12:00-18:00	12:00-18:00	closed	closed	Research	978-HELP
EA	24 hrs	24 hrs	24 hrs	24 hrs	None	978-HELP for Research
Erin (2045)	9:00-22:00	9:00-22:00	12:00-18:00	12:00-18:00	None	Rm 2005
Ramsay Wright	7:00-21:00	7:00-18:00	closed	closed	Undergrads	No
Robarts	8:30-24:00	8:30-24:00	9:00-22:00	13:00-22:00	None	978-HELP for Research
Sidney	7:00-24:00	7:00-24:00	7:00-24:00	7:00-24:00	None	978-HELP for Research
St. Michael's	24 hrs	24 hrs	24 hrs	24 hrs	None	978-HELP for Research
Trinity	8:00-22:00	8:00-22:00	8:00-22:00	8:00-22:00	None	978-HELP for Research
Victoria	8:30-21:00	8:30-21:00	8:00-13:00	8:00-13:00	None	978-HELP for Research

Sites	Advising Hours
CAO	Monday through Friday, 12:00 - 18:00
Erin	Monday through Friday, 09:00 - 22:00

* Research includes graduates, faculty, staff

Computer and Printer Access

Sites	PACX	CDF/PC	CQUEST	Printers
EA	Y			Y*
Erin	Y			Y*
Ramsay Wright			Y	Y**
Robarts	Y	Y		Y*
Sidney		Y	Y	Y**
St. Michael's	Y	Y		Y*
Trinity	Y	Y		
Victoria	Y			

(Y=yes, N=no)
* Public Printers **Site Only

UTCS administers a number of software site licences available to the University of Toronto community. (Usually, this means faculty, staff, and graduate students, though some licences apply to undergraduate students also. See "Restrictions" in the table below.) The licences provide a variety of software at much-reduced cost. The majority of the licences must be renewed each year. Most are terminated when you leave U of T.

Each licence has a contract that you must complete. It outlines your responsibilities and any limitations in the use of the software. All contracts and software are available from the UTCS Information Office, 4 Bancroft Avenue, Room 201. To qualify as a member of the U of T community, you must provide a valid Employee number or Student number.

The table below describes the available site licences. The Restrictions column specifies who may purchase the licence. If the restriction is Research, the payment must come from research money. The Diskettes/Distribution column describes how you actually receive the software. Large packages, like SAS and SPSS, require that you borrow the diskettes, install the software, and return the diskettes. Smaller packages, consisting of up to five diskettes, require you to bring your own diskettes.

For more detailed information about these site licences, telephone the UTCS Information Office at 978-4990.

Site Licences at UTCS

Product/ Operating System	Cost	Restrictions	Licence Period	Diskettes/ Distribution	*
Chaos in the Classroom I: Maps and Bifurcations					
PC	$12.00	Faculty, Staff, Graduate Students	One-time fee	One 5.25" or one 3.5"; bring own	Yes
CSLG					
There are over 250 individual software products included in this package.	$250.00	Departments with Digital hardware	One-time fee	Call 978-4595.	No
IMSL					
UNIX Class IVA machines; FORTRAN Subroutines IMSL (MATH, STAT, SFUN): Exponent Graphics: C BASE Library: Interactive Document Facility: Environmental Install. & Assurance Tests: Registration Fee:	 $935.00 $475.00 $445.00 $140.00 $140.00 $588.00	U of T-owned machines	One-time fee	Tape cartridge or network download	Yes

***Documentation available at UTCS**

Site Licences at UTCS *cont.*

Product/ Operating System	Cost	Restrictions	Licence Period	Diskettes/ Distribution	*
IMSL					
UNIX Class IVB machines; FORTRAN Subroutines		U of T-owned machines	One-time fee	Tape cartridge or network download	Yes
IMSL (MATH, STAT, SFUN):	$565.00				
Exponent Graphics:	$285.00				
C BASE Library:	$265.00				
Interactive Document Facility:	$87.00				
Environmental Install. & Assurance Tests:	$87.00				
Registration Fee:	$588.00				
IMSL					
PC; FORTRAN Subroutines		U of T-owned machines	One-time fee	Deposit $100; borrow and return diskettes	Yes
IMSL (MATH, STAT, SFUN):	$195.00				
Maple (single machine or network server)					
DecStation 2100, 3100 (Ultrix)	$300.00	Staff	One-time fee	Borrow and return diskettes, tape cartridge; network download	Yes
DecStation 5000, 5100 (Ultrix)	$500.00				
DecStation 5400, 5800 (Ultrix)	$760.00				
HP 9000/300, HP 9000, 400 (HP-UX 7.0)	$300.00				
HP 9000/700, HP 9000, 800 (HP-UX 7.0)	$430.00				
SUN 3 (SUN OS 4.0)	$240.00				
SUN 4, SPARCstation (SUN OS 4.0)	$300.00				
SGI Personal IRIS (Irix)	$300.00				
SGI Professional IRIS 50-80GT (Irix)	$500.00				
SGI Professional IRIS 120-240GT (Irix)	$760.00				
PC-386 (DOS; UNIX)	$200.00				
MIPS, RC3230 (UNIX)	$300.00				
IBM RS6000 model 320 (AIX)	$300.00				
Macintosh (Finder)	$130.00				
Note: station cost is half the single machine price.					

***Documentation available at UTCS**

Site Licences at UTCS *cont.*

Product/ Operating System	Cost	Restrictions	Licence Period	Diskettes/ Distribution	*
Novell Netware 3.11 — 20-user Licence					
PC; LAN Server Licence: Upgrade Licence: Upgrade from Other Vendor's Software: Mac Netware 3.0:	 $2400.00 $1335.00 $2000.00 $400.00	University Departments	One-time fee	Deposit $50; borrow and return diskettes	Yes
Novell Netware 3.11 — 100-user Licence					
PC; LAN Server Licence: Upgrade Licence: Upgrade from Other Vendor's Software: Mac Netware 3.0:	 $4670.00 $2000.00 $3336.00 $400.00	University Departments	One-time fee	Deposit $50; borrow and return diskettes	Yes
ProComm					
PC; Communications Note: Documentation on disk; part of package	Free	Faculty, Staff, Graduate Students, Undergraduate	N/A	Two 5.25"; bring own	Yes
QuickMail					
Mac; Electronic mail Per user: Upgrades:	 $35.00 $17.00	Faculty, Staff	One-time fee	One 3.5"; bring own	No

***Documentation available at UTCS**

Site Licences at UTCS *cont.*

Product/ Operating System	Cost	Restrictions	Licence Period	Diskettes/ Distribution	*
SAS/PC					
PC; Statistical analysis BASE/STAT/GRAPH/FSP: IML module: ETS module:	 $35.00 $22.00 $35.00	Faculty, Staff, Graduate Students, Undergraduate	July 1-June 30	Deposit per binder (Maximum $100); borrow and return diskettes	Yes
SAS/PC network					
PC; Statistical analysis Per station:	 $17.00	Faculty, Staff, Graduate Students	July 1-June 30	Deposit per binder (Maximum $100); borrow and return diskettes	Yes
SAS/UNIX (Sun 3)					
UNIX; Statistical analysis BASE/STAT/GRAPH: FSP, IML modules:	 $198.00 ea. $70.00	Faculty, Staff, Graduate Students	July 1-June 30	Tape cartridge	Yes
SAS/UNIX (Sun 4)					
UNIX; Statistical analysis BASE/STAT/GRAPH: FSP module:	 $264.00 ea. $92.00	Faculty, Staff, Graduate Students	July 1-June 30	Tape cartridge	Yes
SPSS/PC					
PC; Statistical analysis FullPackage: Data Entry Module Only:	 $40.00 $20.00	Research	Nov 1-Oct 31	Deposit max. $50; borrow and return diskettes	No
SPSS/PC network					
PC; Statistical analysis FullPackage: Data Entry Module Only:	 $20.00 per station, plus server $10.00 per station, plus server	Research	Nov 1-Oct 31	Deposit max. $50; borrow and return diskettes	No

***Documentation available at UTCS**

Site Licences at UTCS *cont.*

Product/ Operating System	Cost	Restrictions	Licence Period	Diskettes/ Distribution	*
SYSTAT					
Mac; Statistical analysis	$58.00	Faculty, Staff, Graduate Students	July 1- June 30	Six 800KB 3.5" diskettes; bring own	Yes
SYSTAT network					
Mac; Statistical analysis Price per station, plus server:	$29.00	Faculty, Staff, Graduate Students	July 1- June 30	Six 800KB 3.5" diskettes; bring own	Yes
WATFOR-77					
PC; FORTRAN compiler [$35 WATFOR-87 (math co-processor)] GKS (Graphics Kernal System)	$35.00 Add $5.00	Research	July 1- June 30	Two-three 5.25" diskettes; bring own	Yes
WordPerfect (individual & networked machines)					
PC; WordProcessing New, per machine: Upgrade, per machine:	$42.00 $15.00	Faculty, Staff	One-time fee	Deposit $25; borrow and return diskettes	Yes

***Documentation available at UTCS**

PC Maintenance

Below is a listing of microcomputer equipment which UTCS Field Service covers under yearly maintenance contracts. All contracts are based on a minimum 12 month period. Service calls are handled on a first-come, first-served basis. Average response time is four hours. Equipment must be certified as operational prior to commencement of a maintenance contract. (There is no extra charge for this service.) Please contact UTCS Field Service at 978-5050 or 978-6486 to obtain service and pricing information.

IBM PC or Compatible Equipment

Systems
IBM PC or Compatible
IBM PC/XT or Compatible
IBM PC/AT or Compatible
IBM PS/2 - Model 25
IBM PS/2 - Model 30
IBM PS/2 - Model 50

Disk Drives
360KB & 1.2MB 5.25-inch Floppy
720KB & 1.4MB 3.5-inch Floppy

Hard Disk Drives
20,30,40,60 & 80 Megabyte

Displays
Monochrome
CGA / EGA / VGA Colour
PS/2 Monochrome
PS/2 Colour Display

Modems
1200 & 2400 baud

Laser Printers
HP LaserJet
HP LaserJet II
PS Jet +
QMS PS 800
QMS PS 800+
QMS 810

Dot Matrix Printers
C-ITOH F10-40 & F10-55
Epson RX80, FX80 & FX100
Epson LQ800, LQ1000, LQ1500
IBM Proprinter & Proprinter XL
NEC 3550, P5 & P6
Panasonic KX-P1091 & KX-P1092
Roland PR-1012
Toshiba P340, P341, P350 & P1351

Apple Macintosh Equipment

Systems
Mac 128, 512, Plus
Mac Classic - All Models
Mac LC - All Models
Mac SE - All Models
Mac SE/30 - All Models
Mac II, IIx, IIcx, IIci, IIsi, IIfx

Disk Drives
400KB, 800KB 3.5-inch Floppy
1.4MB 3.5-inch Floppy

Hard Disk Drives
20,30,40,60 & 80 Megabyte

Displays
Apple Mac 12-inch Monochrome
Apple Mac 12-inch RGB
Apple High-Res 12-inch Monochrome
Apple High-Res 13-inch Colour

Modems
1200 & 2400 baud

Laser Printers
Personal LaserWriter LS
Personal LaserWriter NT
LaserWriter
LaserWriter Plus
LaserWriter IINT
LaserWriter IINTX

Dot Matrix Printers
ImageWriter I
ImageWriter II
ImageWriter II/L
Apple StyleWriter

Support for UNIX

We support timesharing on GP UNIX under Sun OS 4.1.1.

Support for VM/CMS

We support CMS release 6.0 under CP/HPO releave 6.0 For CMS support, call Supervisor Ted Sikorski at 978-6602.

Support by UTCS Advising

The following are microcomputer software packages supported by the UTCS Advising and Consulting Group. This service is available to University of Toronto faculty, staff, and graduate students. For assistance with the products listed below, call 978-HELP, Monday through Friday, between 12:00 noon and 6:00 p.m.

Package/Compiler	Version	Environment
Communications		
File Transfer & Terminal Emulators		
MacKermit	0.9(40)	Macintosh
ProComm	TU 2.4.2	MS-DOS
Database Managers		
dBASE IV	1.1	MS-DOS
FoxBASE Mac	2.01	Macintosh
Electronic Mail		
QuickMail	2.2.3	Macintosh
Operating Systems		
IBM PC & Compatibles		
IBM PC-DOS	4.0	n/a
Microsoft MS-DOS (incl. IBM PC-DOS)	3.3	n/a
Macintosh		
Finder	6.0.X	n/a
MultiFinder	6.0.X	n/a
System	6.0.X	n/a
Spreadsheet & Charting		
Lotus 1-2-3	2.02	MS-DOS
Microsoft Excel	2.2a, 3.0	Macintosh
Statistical		
SAS/PC	6.04	MS-DOS
SPSS/PC+	4.0	MS-DOS
SYSTAT	3.2, 5.1	Macintosh
SAS	5.18, 6.07*	VM/CMS
SPSS^x	3.1, 4.1	VM/CMS
SAS	6.03, 6.07	UNIX, Sun3, Sun4
Word Processing		
Microsoft Word	4.0	Macintosh
WordPerfect	5.1	MS-DOS

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